

Transportation Management Plan Guidelines



Division of Traffic Operations
Office of System Management Operations

June 2009

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Introduction

With the construction of California's State Highway System virtually complete, the major emphasis of the California Department of Transportation (Department) has largely shifted from new construction to reconstruction, operation, and maintenance of existing facilities. As traffic demand steadily increases, work activities on the State Highway System can result in significant additional congestion, particularly in urban centers. Advance planning and coordination among the Department's various divisions are necessary to ensure that planned highway work will not result in extensive traffic delays to the public.

The concept of implementing a Transportation Management Plan is not new. The Department's Districts have used transportation management strategies for decades to move motorists through work zones quickly and safely. The Department officially established the Transportation Management Plan program in 2000 through Deputy Directive 60 (DD-60) outlining strategies needed to minimize traffic congestion during road work activities. Transportation Management Plan strategies are required for all planned construction, maintenance, and permit activities, which may range from a minor guardrail repair to a major bridge construction project.

These guidelines identify the processes, roles, and responsibilities for preparing and implementing Transportation Management Plans, as well as useful strategies for reducing congestion and managing work zone traffic impacts.

Pertinent Departmental and Federal Policies

The following are departmental and federal policies pertinent to the development and implementation of Transportation Management Plans:

- **DD-60-R1 Transportation Management Plans (September 2007)** establishes departmental policy related to the various roles and responsibilities in TMP development and implementation (see Appendix A).
- **Federal Highway Administration (FHWA) Final Rule, 23 Code of Federal Regulations 630, Subpart J**, referred to as the “**Work Zone Safety and Mobility Rule**” requires the Department to adopt policies and a program that implement Transportation Management Plans on all federally funded highway projects. On October 12, 2007, FHWA issued a Letter of Certification stating that the Department's policies and program are consistent and compliant with the Final Rule.

Key Terminology

The following are key terms used throughout this document.

“Transportation Management Plan (TMP)” is a program of activities for alleviating or minimizing work-related traffic delays by the effective application of traditional traffic handling practices and an innovative combination of various strategies. These strategies encompass public awareness campaigns, motorist information, demand management, incident management, system management, construction methods and staging, and alternate route planning. Depending on the complexity of the work or magnitude of anticipated traffic impacts, a TMP may provide lane requirement charts, Standard Special Provisions for maintaining traffic, and for a major project, a separate comprehensive report.

“Work Zone” is the active area of a highway where construction, maintenance, or utility activities are being conducted. The work zone extends from the location of the first temporary traffic control device to the last temporary control device.

“Major Lane Closures” are closures that are expected to result in significant traffic impacts despite the implementation of TMPs. These closures can be implemented for capital projects, maintenance, or permit activities. A “significant project” as defined by the FHWA Final Rule, is one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts greater than what is considered tolerable based on State policy or engineering judgment. This term is not used in these TMP Guidelines, because it refers primarily to capital projects and is not all-inclusive; maintenance and permit activities are not necessarily considered as projects, but the Districts prepare TMPs for those activities.

“Significant Traffic Impact” was initially defined in DD-60 as an individual traffic delay of 30 minutes or more above a motorist’s normal travel time. Significant traffic impacts can also occur when motorists experience shorter individual delays that may extend over several months or years. In some cases a full closure of a freeway segment may be justified for a short duration when compared to several months of weekend closures that may severely impact the business community and the public in general. The objective in developing TMP strategies is to balance short-term and long-term impacts to the traveling public with the safe, efficient delivery of highway construction projects and work zone activities.

“District Lane Closure Review Committee” (LCRC) is comprised of the Deputy District Directors of Construction, Design, Maintenance, and Traffic Operations, and the District Public Information Officer (PIO). The California Highway Patrol (CHP) may be asked to participate in the committee as appropriate. The District LCRC participates in planned project activities that are expected to (1) result in significant traffic impacts or (2) be of an interregional, statewide, environmental, or otherwise sensitive nature. For example, the District LCRC may decide to implement a full or extended closure to minimize the individual delay (for example, if the individual traffic delay will exceed 30 minutes) or if the total delay over the duration of the project will greatly inconvenience the public. Recent examples include the Interstate 80 Labor Day weekend closures on the San Francisco-Oakland Bay Bridge for retrofit work in 2006 (full closure in the

eastbound direction) and in 2007 (full closure of the bridge in both directions) rather than numerous consecutive weekend closures that would have greatly impacted tourist and commercial traffic. The Interstate 5 “Boat” Project full closures (alternately in the northbound and southbound directions) in the summer of 2008 allowed the Department to complete the work several months ahead of time with significantly less overall impact to the public.

“Headquarters Lane Closure Review Committee” (HQ LCRC) is comprised of the Division Chiefs of Construction, Design, Maintenance, and Traffic Operations, and the Deputy Director of External Affairs. CHP will be asked to participate as appropriate at the Headquarters (HQ) level. In rare instances, the HQ LCRC may be contacted by the District LCRC to inform management of potential impacts that may be considered press-worthy. The HQ LCRC may also be asked to conduct a TMP review and provide recommendations.

Acronyms

ADA	Americans with Disabilities Act of 1990
CCTV	Closed-Circuit Television
CHIN	Caltrans Highway Information Network (511)
CHP	California Highway Patrol
CMS	Changeable Message Signs
COS	Capital Outlay Support
COZEEP	Construction Zone Enhanced Enforcement Program
CPSD	Capital Project Skills Development
CTC	California Transportation Commission
DD	Deputy Directive
DTM	District Traffic Manager
EA	Expenditure Authorization
EMS	Extinguishable Message Sign
FHWA	Federal Highway Administration
FSP	Freeway Service Patrol
HAR	Highway Advisory Radio
HOV	High-Occupancy Vehicle
HQ	Headquarters
ITS	Intelligent Transportation System
LCRC	Lane Closure Review Committee
LCS	Lane Closure System
MAZEPP	Maintenance Zone Enhanced Enforcement Program
PA&ED	Project Approval and Environmental Document
PCMS	Portable Changeable Message Sign
PeMS	Freeway Performance Measurement System
PID	Project Initiation Document
PIO	Public Information Officer
PS&E	Plans, Specifications and Estimates
RE	Resident Engineer
RTL	Ready to List
RTPA	Regional Transportation Planning Agencies
SSP	Standard Special Provisions
TMC	Transportation Management Center
TMP	Transportation Management Plan
TMT	Traffic Management Team
TTC	Temporary Traffic Control
WBS	Work Breakdown Structure

1.0 WHAT'S IN A TRANSPORTATION MANAGEMENT PLAN (TMP)?

1.1 GENERAL

A TMP encompasses activities that are implemented to minimize traffic delays that may result from lane restrictions or closures in a work zone. TMP strategies are designed to improve mobility, as well as safety for the traveling public and highway workers.

1.2 TRANSPORTATION MANAGEMENT PLAN STRATEGIES

TMP strategies are categorized as follows:

- A. Public Information
- B. Motorist Information
- C. Incident Management
- D. Construction
- E. Demand Management
- F. Alternate Routes (or Detours)

The TMP strategies selected are dependent on the type of work that is planned, the geographic and demographic area in which the work is located, and the anticipated traffic impacts. This section describes strategies that may be considered where appropriate.

1.2.1 CATEGORY A. PUBLIC INFORMATION

The public is highly interested in advance roadway information so that they can plan their travel accordingly. Due to the strong emergence of the Internet and hand-held electronic devices, public notification of planned and ongoing highway work is one of the most effective tools for reducing congestion in work zones. When the public is equipped with work zone information before they begin traveling, they have the opportunity to adjust their travel plans. Advance roadway delay information can decrease the number of vehicles that may travel through the work area and can help to minimize traveler frustration. The information provided should include alternative transportation modes, such as transit services and bicycle routes that can be accessed during project construction and can lead to fewer vehicles on our highways and less congestion. In addition, public awareness campaigns inform the public of the overall purpose of the project and can help generate and maintain public support. Many of these strategies are typically used for major construction projects but can also be effectively applied to highway maintenance work or permit activities that may significantly affect traffic conditions.

A1. Brochures and Mailers. Brochures and mailers are printed material containing project-related information such as advance notice of the project's start date, schedules, pictures/graphics of the project, a description of the need for the project, alternative routes, alternative modes of transportation, and transit services. These may be disseminated to motorists at key locations, including businesses, rest stops, travel information centers,

automobile associations, and through direct mailings to affected businesses and residents in the project area.

A2. Press Releases/Media Alerts. This strategy provides timely project-related information to the news media, affected businesses, and other affected or interested parties using print and/or electronic media. Examples of these groups include local and cable television newsrooms, traffic navigation systems groups, schools, local major employers and businesses, and emergency services (fire, law enforcement, and ambulance). News media strategies (for example, newspaper, television, and radio press releases) are a no-cost alternative proven to be very effective in notifying travelers of planned roadway work. Various mechanisms fax, e-mail, telephone message, and mailings can be used to communicate information relating to start dates, work schedules, significant traffic pattern changes, transit routes, traffic collisions, and other incidents within the work zone.

A3. Paid Advertisements. Paid public service announcements of an upcoming major project may be transmitted through newspaper, radio, and television ads, as well as billboards. Paid advertisements can also be used for progress updates or to provide information regarding major changes to the work zone configuration and traffic management strategies. A cost analysis should be conducted to determine the expense of developing a public service announcement against the value of the number of targeted audiences the information will reach.

A4. Public Information Center. This is a small-scale facility typically located on or near the project site that contains such materials as scale-model displays, maps, brochures, videos describing the project, its potential traffic impacts, and available travel alternatives to minimize those impacts, including available transit routes and transit agency contact information.

A5. Telephone Hotline. This traveler information strategy provides traffic or travel information for the work zone using a toll-free telephone number. It can include prerecorded messages or real-time, interactive request/response information and a link to 511 (travel information telephone direct line).

A6. Planned Lane Closure Web Site. The Lane Closure System (LCS) is a statewide Web-based application that allows users to request, review, approve or deny, and monitor planned lane closures on the State Highway System. The purpose of the LCS is to provide California highway workers and motorists with a single source of information on traffic closures on the State's highways. The system operates continuously, providing real-time information on lane closures located in both urban and rural areas. The information is posted to District Web sites listing the routes involved, the type of work being performed, and the closure start and end dates and times. The LCS information is planned to be incorporated into the statewide 511 travel map.

A7. Project Web Site. A project Web site provides information for a specific work zone including long-term static information on project plans and progress, as well as real-time interactive information.



A8. Public Meetings/Hearings. This strategy involves the presentation of project information to the community and businesses by public relations staff and solicitation of input of potential concerns, impacts, and management strategies. Public meetings often involve the use of videos, slides, and graphical presentations to supplement public announcements and public information center displays.

A9. Community Task Force. The development of a community task force, which includes various stakeholders (businesses, neighborhood groups, employee transportation coordinators, interested individuals, public officials, or other representatives) that may be impacted by the work zone, can facilitate the dissemination of information related to a transportation project. A task force can also help generate interest and support for a project.

A10. Communication with Selected Stakeholders. Stakeholders most directly affected can be identified and can receive information during construction on a regular basis through periodic meetings or e-mail and fax notices.

A11. Information Kiosk. A kiosk is a small information center that can provide handouts and other information to passersby. The kiosk should be located in an area with high foot traffic in the general vicinity of the work location. Sample locations are shopping malls, rest stops, and gas stations.

A12. Freight Travel Information. This strategy may be appropriate when there is a moderate to high percentage of freight movement through the work zone. It involves coordination with the freight community (trucking companies and truck drivers) to disseminate work zone information considered useful (for example, truck restrictions, occurrences of traffic incidents, planned closures, and detours) and development of a mechanism to provide that information to freight stakeholders at central locations or to truckers as they approach the work zone.

1.2.2 CATEGORY B. MOTORIST INFORMATION



Motorist information is vital to travelers approaching a work zone and who still have time to make a decision that could divert them away from possible congestion. Given available information on travel delays or alternative routes prior to a decision point, the motorists can play an active role in completing their trips more smoothly and help reduce the overall congestion. When motorists are stuck in congestion, they can become frustrated and impatient. When they are given information on the length of delay and the reasons for the delay, their frustration levels are usually reduced.

B1. Traffic Radio Announcements. Traffic-related information is typically disseminated via regularly scheduled traffic reports on commercial radio stations. These reports are usually scheduled during morning and evening peak hour commute periods.

B2. Fixed Changeable Message Signs (CMS). These are fixed, overhead message signs placed along roadways to notify road users of lane and road closures, work activities, traffic incidents, potential work zone hazards, traffic queues (backups), travel time, or delay information, as well as alternate routes in or around the work zone. In some cases new CMS may be warranted; these signs should be installed before actual construction of the project to provide ample notification to the public. Communication and coordination with the District Transportation Management Center (TMC) for activation and use of the CMS during construction should be included in the TMP.

B3. Portable Changeable Message Signs (PCMS). PCMS can be placed at key locations to notify motorists of lane closures, alternate routes, expected delay, and upcoming road closures. These signs can be used to inform drivers of speed limit reductions and enforcement activities in a work zone, as well as projected delay or road opening times. The appropriate sign placement is included in the project plans. PCMS are typically deployed as a part of project signing. As a TMP measure, additional PCMS may be specified when warranted, based on factors, such as roadway geometrics or proximity to interchanges.

B4. Temporary Motorist Information Signs. Temporary conventional signs mounted in the ground or overhead provide traveler information to guide motorists through the work zone.

B5. Dynamic Speed Message Sign. This portable system can be mounted as a fixed sign or located on a portable trailer. Radar measures the speed of approaching vehicles, which is displayed on the sign along with the work zone speed limit. The objective of this system is to enhance safety by encouraging speed limit compliance.

B6. Highway Advisory Radio (HAR). Fixed or portable HAR systems provide detailed messages beyond the limitations of roadside signage. HAR involves the dissemination of

information to motorists over wide-area wireless communications directly to in-vehicle radios. Extinguishable message signs (EMS) are typically associated with HAR systems where the sign indicates how to obtain information on roadway conditions by tuning into a specific radio station (for example, "Tune in to 1610 AM"). These signs turn on and off depending on whether the HAR has a message available. EMS, signs with flashing beacons, fixed CMS, and PCMS can be used to inform motorists of the radio frequency for the available information.

B7. Caltrans Highway Information Network (CHIN or 511) Traveler Information Systems. This strategy provides motorists with work zone-related information, static (project dates) or real-time (potential delays) or both, using technology such as cellular telephones, pagers, in-vehicle systems, and e-mail notifications.



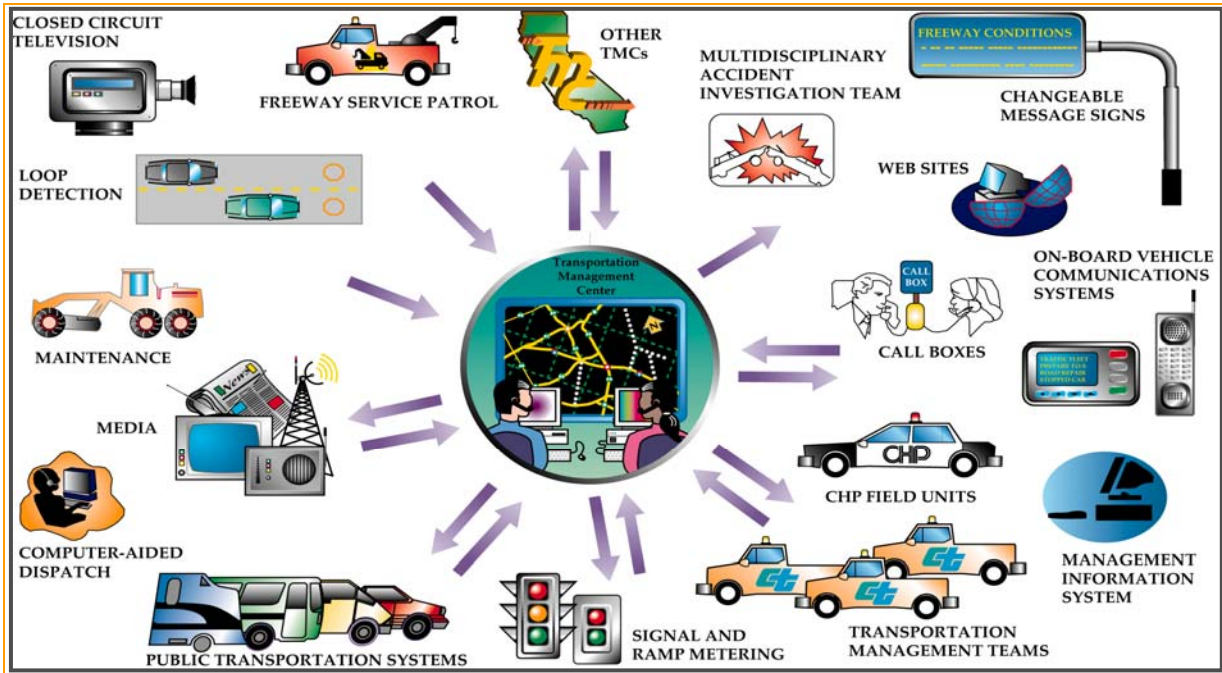
B8. Wizard CB Alert System. The Wizard CB Alert System is a device that continuously broadcasts over CB radio a message that warns approaching drivers of the work zone ahead. The information, specifically targeting truckers, can be broadcast over any selected CB channel, but since most truckers listen to channel 19, broadcasting over that channel means truckers generally do not need to take action to receive the message.

1.2.3 CATEGORY C. INCIDENT MANAGEMENT

When traffic incidents occur on the State Highway System in or near a work zone, the most effective tool in reducing potential congestion is to remove the elements of the incident from the roadway as quickly as possible. An incident may range in severity from a flat tire to a multiple big rig collision with a hazardous waste spill that closes a section of highway for several hours. A standing protocol is in place for all traffic incidents as a part of the Traffic Operations Division's Incident Management Program. However, the TMP Manager should determine whether the standard protocol should be supplemented or whether additional strategies may be needed for certain types of projects or in certain areas.

C1. Transportation Management Center (TMC). This strategy involves the use of a TMC for coordinating and managing traffic and incident information dissemination. The TMC controls all fixed Intelligent Transportation System (ITS) elements and in some cases portable HAR and PCMS. If the project is large and of long duration, a mobile project-specific TMC vehicle may be used to help manage traffic incidents and maintain efficient traffic flow through and around the work zone. The following diagram depicts the many components used at the TMC:

TMC COMPONENTS



C2. Traffic Management Teams (TMT). The TMTs respond to assist in managing traffic during incidents and planned lane closure activities that are expected to result in significant vehicle queuing. The primary purpose of the TMTs is to minimize secondary, end-of-queue collisions. In some cases these services can be provided by the contractor with the appropriate contract provisions.

C3. Intelligent Transportation Systems (ITS). ITS can be used in work zones to identify areas where traffic flow is impeded so traveler information can be provided and adjustments to the work zone can be made. Work zone ITS deployment uses sensors to detect traffic conditions and can automatically feed the information to traveler information outlets such as CMS, Web sites, or a TMC. ITS elements already installed in the field should be used as part of a TMP when practical. ITS elements installed as part of a project should be maintained in operational condition by the contractor throughout the duration of the work. This can be accomplished by reviewing contract plans, identifying and evaluating potential impacts to ITS elements, and including the appropriate standard special provisions in contract documents.

C4. Surveillance Equipment. This strategy involves the use of surveillance equipment, such as closed-circuit television (CCTV), loop detectors, lasers, probe vehicles, or cameras, to help identify traffic problems and to detect, verify, and respond to expected traffic impacts and incidents in the work zone.

C5. Helicopter for Aerial Surveillance. This strategy involves the use of aerial surveillance to identify and verify traffic problems and incidents. Helicopters are especially useful in highly urbanized areas where several routes may be severely impacted by traffic congestion on any one route.

C6. Tow/Freeway Service Patrol. This strategy involves the use of dedicated or on-site (or near-site) towing services to reduce the time required to remove vehicles involved in a traffic incident (breakdown or crash) from the roadway. Any type of incident near a work zone can significantly impact traffic conditions and may result in secondary collisions due to driver lack of attention.

C7. Dedicated (paid) Law Enforcement. The Department contracts with the CHP to provide enhanced enforcement services through two programs:

- The Construction Zone Enhanced Enforcement Program (COZEEL).
- The Maintenance Zone Enhanced Enforcement Program (MAZEEL).

The visibility of CHP presence alerts motorists that road work is being performed on the roadway and that motorist behavior is under surveillance. The officers are directed by the onsite field supervisor (construction or maintenance supervisor) to patrol the work zone area or to remain stationary. Priority should be given to these services during night time operations and where workers are on foot in the work zone. Workers on foot have an increased exposure to serious injury or death from errant motorists. Refer to the Construction or Maintenance manual for implementation criteria to determine when these services are warranted or recommended. A COZEEL/MAZEEL Pocket Guide has been developed for the Resident Engineer's (RE) use in work zones, describing suggested enforcement strategies to be used, and contact names and phone numbers including TMC contact information (see Appendix B). The Pocket Guide should be distributed to CHP and to other field staff.

1.2.4 CATEGORY D. CONSTRUCTION

Construction strategies can be effective in reducing congestion in a work zone. These strategies include, among others, innovative construction staging plans, lane requirement charts requiring crews to work at night instead of during daily peak commute periods, full closures of a roadway segment for a short period instead of nightly closures for several months or years, use of reversible lanes that can be modified to accommodate peak hour traffic in either direction, and use of contractor incentive and disincentive clauses within the contract. Similarly, reduced speed limits in work zones may not reduce congestion, but may make travel through the work zone safer for workers and the traveling public.



D1. Lane Requirement Chart. These charts identify the number of lanes that must be open for traffic each hour of the day to minimize delay when work activities are being conducted. These charts restrict work hours so that traffic is not affected during periods of peak travel demand and congestion (for example, peak hours, holidays, or special events). Work is typically performed during off-peak periods, such as at night, to minimize work zone impacts to motorists and adjacent businesses.

D2. Construction Staging. The Stage Construction Plan shows the sequence of construction activities. The Order of Work specification may identify portions of the project to be completed in a specific sequence to minimize impacts to the traveling public.

D3. Traffic Handling Plans. Traffic handling plans contain sufficient alignment detail, profiles, and typical cross-sections to guide traffic through the work zone in the sequence shown in the Stage Construction Plan.

D4. Full Facility Closures. This strategy involves complete closure of a roadway (either in one or both directions) or a freeway-to-freeway connector (ramp closures are typically not considered full closures). Full closures can minimize the duration of the project and improve worker safety. Full closures may be brief (intermittent, off-peak), short-term (night, weekend), or long-term (continuous for the duration of the project). Full closures typically require the involvement of the District PIO to ensure that a public information campaign with adequate advance notification is developed and implemented. The TMP Manager determines if a full roadway or freeway-to-freeway connector closure should be reviewed by the District LCRC and the HQ LCRC. Impacts to the alternate route should be monitored and managed to the extent possible. The Department encourages the use of full closures where feasible as long as adequate advance planning is conducted and appropriate TMP measures are implemented.

D5. Lane Modifications. It is essential to maintain the existing number of highway lanes to the extent possible. This can be done through lane modifications, which are typically in place for extended periods. Special consideration should be given to accommodate extra-high and extra-wide trucks where possible. Lane width reductions to less than 12 feet require approval from the District Traffic Liaison as well as a design exception. Lane modifications must also consider bicycle and pedestrian users and emergency parking. Efforts should be made to limit the time a lane or shoulder is closed or reduced in width. Modifications may include the following:

- **Reduced Lane Widths to Maintain Number of Lanes (Constriction).** This involves reducing the width of one or more lanes in order to maintain the existing number of lanes on the facility while permitting work access to part of the facility.
- **Lane Closures to Provide Worker Safety.** This strategy closes one or more existing traffic lanes to accommodate work activities.
- **Reduced Shoulder Width to Maintain Number of Lanes.** This involves reducing the width of the shoulder for use as part of the traffic lane by shifting traffic onto the shoulder, allowing access for the work activities to take place. Adequacy of the shoulder pavement section to handle mainline traffic should be verified before using this strategy.
- **Shoulder Closures to Provide Worker Safety.** This strategy closes the shoulder for use by the public, making it available to accommodate the work activities. Where bicyclists or pedestrians are allowed, shoulder closures must provide for alternate accommodations.
- **Lane Shift to Shoulder or Median to Maintain Number of Lanes.** This strategy involves diverting traffic onto the shoulder/median, or a portion of the shoulder/median, for use as a traffic lane.

D6. One-Way Reversing Operation. On two-lane highways, one-way reversing traffic control involves alternately stopping traffic in one direction, allowing work activities to occur

in the lane that is closed. The TMP Manager determines the maximum time that each direction should be stopped so that motorists do not experience undue delays.

D7. Two-Way Traffic on One Side of Divided Facility (contra-flow or crossover).

This strategy involves closing one side of a divided facility to permit work to proceed without traffic interference while both directions of traffic are accommodated on the opposing side of the roadway. For example, on a four-lane highway, two lanes in the northbound direction would shift to the southbound side so that work could be done on the northbound side. When completed, all traffic would shift to the northbound side, while work was conducted on the southbound side.



D8. Reversible Lanes. This strategy, also known as variable lanes, involves sharing lane(s) of travel to accommodate peak-period traffic flow. The direction of travel in the shared lane switches by time of day or day of the week.

D9. Ramp Closure/Relocation. A ramp closure involves closing one or more ramps in or near the work zone for specific periods or construction phases to allow work access. In some cases, a temporary ramp may be constructed to maintain access. Standard special provisions typically do not allow the closure of consecutive off-ramps.

D10. Night Work. Work is performed at night (end of evening peak period to beginning of morning peak period) to minimize work zone impacts on motorists and adjacent businesses. Consideration should be given to potential impacts to residents due to noise, worker safety, and temperature requirements for paving operations.

D11. Extended Weekend Work. A construction work window may allow work to be performed during weekend periods from the end of the Friday afternoon peak period to the beginning of the Monday morning peak period (a 55-hour closure). This strategy may be difficult to implement in an area where there is a high volume of weekend tourist traffic. Consideration should be given to avoiding weekends in areas that may have a high volume of special events or tourist traffic.

D12. Pedestrian/Bicycle Access Improvements. This requirement involves providing alternate facilities for bicyclists and pedestrians per DD-64-R1 in places where the work zone may impact their accessibility and movement during highway work activities. Provisions of shuttle service may be necessary (see Section E9).

D13. Maintain Business Access. When a project has a direct impact on businesses, accessibility issues may warrant signage or specific information to direct motorists to the businesses and relocation of access locations.

D14. A+B Bidding. A+B bidding encourages contractors to minimize construction impacts by reducing construction time. Part A refers to the contractor's bid for the actual items of work. Part B is the total number of days bid to complete the project multiplied by the daily

road user cost (road user cost plus standard liquidated damages) stipulated in the contract. The combined values of the A and B parts determine the winning bid. The contractor may be assessed additional liquidated damages if the work is not completed and will impact the designated routes specified in the special provision. A+B bidding is primarily used on projects of \$5 million or more with a daily road user delay cost of \$5,000 or more.

D15. Incentive/Disincentive Clauses. This strategy involves the use of incentives and disincentives in the construction contract to minimize construction duration. Calculations to support incentive and disincentive clauses are prepared with the proposed specification language.

D16. Innovative Construction Techniques (for example, precast members, rapid cure materials). These strategies involve the use of special materials, such as rapid curing concrete or precast items (for example, culverts, bridge deck slabs, and pavement slabs) to minimize the duration of construction or maintenance activities where traffic restrictions need to be minimized (for example, roadways with high volumes), and when work activities need to be completed during night or weekend periods to allow reopening travel lanes for normal weekday travel.

D17. Railroad Crossing Controls. When a rail crossing is located within a work zone or on a detour or diversion route, traffic control enhancements at the crossing may become necessary for safety purposes, especially if work zone delays and congestion have the potential to force vehicles to stop on the tracks or between the crossing gates. Enhancements may include advance warning signs, railroad crossing signs, pavement markings, flashing lights, gate arms, flaggers or law enforcement officers, and possibly closure of crossing to traffic during work periods.

D18. Coordination with Adjacent Construction Site(s). This strategy involves combining, coordinating or staging projects within a specific corridor to minimize the combined impacts on the motoring public and community. The objective is to ensure that adequate capacity remains available to accommodate the anticipated travel demand within the corridor by not implementing work zones on adjacent or parallel highways at the same time. This may entail communicating information about the timing of lane closures and coordinating diversion routes. It may also involve the completion of needed capacity and safety improvements on a highway prior to its use to carry traffic diverted or detoured from another project. Construction staging can be used to remove work at the same location or traffic control conflicts between adjacent projects.

D19. Speed Limit Reduction. A reduced speed limit may improve traffic and worker safety in a work zone. Speed limit reductions may be implemented through an entire work zone or only in active work areas. Reduced speed limits may also be appropriate on detours where traffic volumes and conflicts are increased. This strategy can be used in combination with a speed radar trailer (dynamic speed message sign) to alert motorists of their speed.

D20. Traffic or “Gawk” Screens. Traffic screens help prevent driver distractions in work zones by blocking the motorist’s view of the activities. This strategy helps to keep traffic moving and enhance safety. Screens may be mounted on top of temporary traffic barriers to discourage gawking.

D21. Bus Priority Access. Providing bus-only lanes or other features to ensure buses can travel through a construction zone with minimal delay will entice the public to use transit and decrease the number of vehicles that travel through the corridor.

1.2.5 CATEGORY E. DEMAND MANAGEMENT

Demand management strategies can be used to encourage motorists to travel either in carpools or mass transit vehicles, or to vary work hours to reduce the typical peak hour traffic volumes. Rideshare incentives include free transit tickets or tickets at a reduced price. Park-and-ride lots can be built as a part of the project to encourage commuters to travel together, not only during but also after construction is completed.

TMP teams should contact local transit providers to establish a plan, using the elements below, to use existing transit services and resources to lessen the impact of the construction project on person-throughput throughout the corridor. Public information methods should educate the public on the plan and transit elements that are available. This could lead to a short-term reduction of traffic during construction and might lead to long-term benefits of increased ridership after the project is finished. Transit incentives should be considered for all projects and implemented when deemed effective.



E1. Telecommuting. Telecommuting means working outside of the traditional office or workplace, usually at home. Motorists, particularly in an urbanized area, who normally travel through the work zone, can be encouraged to telecommute for the duration of a project to reduce the travel demand.

E2. Truck/Heavy Vehicle Restrictions. This strategy encourages truckers to use detours or alternate routes during specific periods or at all times increasing passenger vehicle capacity of the roadway on a facility that normally has a high truck volume.

E3. Parking Supply Management. This strategy involves reducing traffic demand in the work zone area by limiting parking supply, typically through price increases.

E4. Variable Work Hours. This strategy involves encouraging motorists who typically travel through the work zone during peak periods to work variable hours (off-peak) to reduce travel demand.

E5. Ramp Metering. Ramp meters are traffic signals located on on-ramps or freeway connectors designed to decrease demand on a highway facility by controlling the entrance of vehicles, matching entering vehicles to gaps in the traffic stream. Various strategies for ramp metering include preset timing, traffic actuated metering changes (based on mainline traffic volumes), or centrally controlled metering. Ramp metering may be used during peak periods or all day to modify on-ramp traffic directly upstream of the work zone. Portable or temporary ramp meters are options.

E6. Ramp Closures. Temporary closure of one or more on-ramps in or around the work zone may be used to improve traffic flow on the mainline. Consideration must be given to notify emergency services and to provide adequate alternatives for emergency vehicles.

E7. Transit Service Improvements. Where appropriate, transit service improvements may include the modification of transit schedules or routes, increases in frequency, or the establishment of transit service in or near the project corridor.

E8. Transit Incentives. Transit incentives include employer or traveler transit subsidies and guaranteed ride home programs.

E9. Shuttle Services. Shuttles and charter buses can reduce traffic volumes through a work zone if a sufficient number of users along the corridor are anticipated to use the service. Shuttle services must be used where pedestrians or bicyclists are allowed and do not have alternate access through a work zone.

E10. Ridesharing/Carpooling Incentives. This strategy involves the use of rideshare/carpool incentives to reduce the number of vehicles traveling through a work zone. Incentives may include preferential parking for carpools, the addition of mainline High-Occupancy Vehicle (HOV) lanes or bypass lanes on ramps, and provisions for vanpool vehicles.

E11. Park-and-Ride Promotion. This involves the development, expansion, and promotion (advertising) of Park-and-Ride lots to encourage ridesharing or transit use, thus reducing the number of vehicles traveling through the work zone.

1.2.6 CATEGORY F. ALTERNATE ROUTES (OR DETOURS)



Alternate route (or detour) strategies can be used to give travelers the opportunity to avoid the work zone completely by diverting to other highways or adjacent surface streets. This strategy includes examining the adequacy of detour or alternate routes and coordinating with the agencies responsible for those routes and the transit services on the routes. Use of a detour may require improving the effectiveness of the detour route by restricting parking or placing traffic control officers at critical intersections to help move traffic along during peak periods. Bicycle and pedestrian accommodations (for example, access and length) must be considered when using alternate routes during construction.

F1. Off-site Detours/Use of Alternate Routes. This strategy involves rerouting some or all traffic from the roadway under construction or repair to other roadways. Detours need to be evaluated to accommodate extra-high and extra-wide trucks; any restrictions must be reported to the Transportation Permit Office. Before the work begins, it is advised to record the condition of the detour route to allow assessment of the roadway condition after the work is completed. During the work, traffic conditions on detours should be monitored to make sure that motorist delays remain within acceptable levels.

F2. Signal Timing/Coordination Improvements. This strategy involves retiming traffic signals to increase vehicle throughput of the roadway(s), improve traffic flow, and optimize intersection capacity in and around the work zone. Signal timing and coordination could include transit vehicle priority.

F3. Temporary Traffic Signals. The installation of temporary traffic signals can be used to improve traffic flow through and near the work zone. At a corridor or network level, the use of temporary traffic signals is more effective than stop signs or flaggers for providing mobility through the work zone area. These temporary traffic signals may also be coordinated with existing signals.

F4. Street/Intersection Improvements. Improvements on streets and intersections for the roadway or alternate routes may be necessary to provide increased capacity to handle the traffic through the work zone or within the adjacent corridor. This may include improvements to the mainline and intersections, including roadway or shoulder widening and construction of new through lanes and turn lanes. Pedestrian, bicycle, and transit needs should be carefully considered to maximize the positive impact of alternative modes.

F5. Bus Turnouts. This strategy involves the construction of bus stop areas that are recessed from the travel lanes. This strategy may be helpful in work zones or on detour routes with a high frequency of bus traffic.

F6. Turn Restrictions. This involves restricting turning movements for driveways and intersections to increase roadway capacity, reduce potential congestion and delays, and improve safety. Restrictions may be applied during peak periods or all day.

F7. Parking Restrictions. This strategy involves the restriction of parking in all or part of the work zone or alternate routes during work hours or peak traffic periods along alternate routes. Parking restrictions can be used to:

- Increase capacity by converting the parking lane to an additional travel lane.
- Reduce traffic conflicts.
- Provide improved access to the work area.

1.3 PRELIMINARY INFORMATION NEEDED FOR DEVELOPING A TMP

When developing a preliminary TMP, use the most current layout of the roadway (geometrics) information and plans available. The most current traffic volumes either at the specific location or as close as possible to the work zone site should be used to determine possible traffic impacts. Traffic information can be accessed through various sources: through the Department's Internet traffic data Web site (<http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/>), the Freeway Performance Measurement System (PeMS – <https://pems.eecs.berkeley.edu>) via the loop detection system (devices set into the pavement that collect traffic data), special manual vehicle and occupancy counts, and through tachometer surveys which provide time and speed information. If current traffic counts are not readily available, a request for a new count should be submitted to the Department's Traffic Data and Photolog Office.

The data is typically used to determine the expected traffic delay at the work site and the work windows that will be made available. Sometimes projects that have been programmed and funded are “shelved” or delayed for a year or more, due to funding or environmental issues. When these projects are put back on the schedule, the traffic volumes and associated work windows need to be reviewed and updated to reflect the latest traffic conditions.

Information to consider when developing a TMP is listed in the following table.

Table 1.0 Items for Consideration in Developing a TMP

<ul style="list-style-type: none"> • Latest traffic volumes (motorized, nonmotorized and truck traffic). • Lane closure policies and procedures. • Political or environmental issues. • Multijurisdictional communication and buy-in. • CHP and local law enforcement involvement. • Percentage of truck volume. • Business and affected activity centers impacts. • Clearance of alternate routes for Surface Transportation Assistance Act and oversized trucks. 	<ul style="list-style-type: none"> • Concurrent corridor (including conflicting) construction projects. • Length of project (miles). • Urban versus rural conditions. • Time constraints (including duration). • Transit and Railroad services. • Viability of alternate routes. • Impacts on bicyclists, pedestrians, senior citizen facilities, or schools. • Current project layout and staging.
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1.4 TMP CLASSIFICATIONS

TMPs can be classified by the anticipated impact of the highway work on the traveling public. The District TMP Manager determines the level of treatment required for the proposed work. The three classifications are described below.

1.4.1 “Blanket” TMPs

Certain low-impact Maintenance and Encroachment Permit activities do not require the development of detailed work specific TMPs. Those activities performed during off-peak hours on roadways with low volumes might be treated adequately with a “blanket” TMP. A blanket TMP may range in detail from approval for a lane closure by the DTM to a few selected strategies (such as PCMS activation) that would be taken to keep delay below the delay threshold (see example in Appendix C). District Maintenance and Encroachment Permit offices should have a list of activities to which blanket TMPs apply. Depending on the type and duration of the proposed work, a blanket TMP may also include a one-page description of the activities to be performed and contact information for personnel involved in the activities.

1.4.2 “Minor” TMPs

Certain activities may result in traffic impacts on the State Highway System that are not “significant,” as defined in this document, and may require a “Minor” TMP. A Minor TMP will likely include lane requirement charts specifying when the work can be conducted. Depending on the type and duration of the proposed work, a Minor TMP may also include a schedule and detailed description of the activities to be performed and the TMP strategies to be used, such as enhanced enforcement services, motorist information (such as PCMS),

freeway service patrol during peak hours, and advance public information provided to the media.

1.4.3 “Major” TMPs

“Major” TMPs are prepared for capital, permit, and maintenance projects that could significantly impact traffic. Major TMPs may involve full closures (Interstate 5 “Boat” Project closures in District 3, alternating in the northbound and then southbound direction), weekend closures (Interstate 80 San Francisco Oakland-Bay Bridge Labor Day weekend closures in District 4) and continuous closures (Interstate 15 Devore closures in District 8). Generally, major TMPs are typically identified as follows:

- Multijurisdictional in scope, often encompassing the interests of CHP, local law enforcement, city, county, and regional governments, bordering state transportation departments, employers, merchants, developers, transit operators, ridesharing agencies, neighborhood and special interest groups, emergency services, and transportation management associations.
- Multifaceted, comprised of traffic operations, facility enhancement, demand-management, and public relations strategies, as well as more traditional work zone actions, construction methods and contract incentives, customized to meet the unique needs of the impacted corridor.
- In place over an extended period of time, sometimes implemented a year or more before the start of actual construction, with specific elements often implemented incrementally to coincide with construction phasing.

Major TMPs may include the full spectrum of strategies, including lane requirement charts, special provisions for unique project characteristics, a large-scale public awareness campaign (with brochures, public meetings, project Web site, and telephone hotline), COZEEP services, freeway service patrol, detours to alternate highways or surface streets, and special arrangements with local transit services to accommodate a significant increase in ridership. Due to the effort typically required on major TMPs, the Districts may choose to contract with a consultant.

1.5 TMP RESOURCES

The development of TMP strategies is a continuous effort to efficiently and effectively manage traffic in work zones on the State Highway System. Appendix D provides contact information and additional supporting TMP information sources.

2.0 TRANSPORTATION MANAGEMENT PLAN PROCESS

2.1 PROCESS OVERVIEW

TMP development begins at the initiation of the planning process. In the case of capital projects, it begins with the preparation of a TMP datasheet or checklist for each phase of the project as part of the Project Initiation Document (PID) process. The TMP is a “living” document and continues to be modified as work information warrants it. Frequently after construction or maintenance activities begin, if traffic conditions differ from what was anticipated, changes in TMP strategies may be necessary to keep motorist delays below acceptable levels. When modifications are made in the TMP, they should be approved by the TMP Manager.

2.1.1 Corridor, Regional, Multifunctional Area TMPs

When multiple or consecutive projects are within the same general corridor, the cumulative impact can result in excessive traffic delays, detour conflicts, direct traffic control, and work conflicts. These may be multiple capital projects, the involvement of more than one District or local jurisdiction, or a combination of capital projects and encroachment permit and maintenance activities. Corridor, regional, or local coordination will mitigate these impacts thereby minimizing inconvenience to the traveling public.

When multiple projects are in the same corridor or on corridors within the same traffic area, it may be possible to develop a single corridor or regional TMP. In other cases, individual TMPs are developed and funded from their own sources and a “bare bones” corridor or regional TMP addresses the cumulative impact. Each project covered by corridor and regional TMP contributes resources in proportion to its traffic impact.

The TMP Manager coordinates the development and implementation of corridor and regional TMPs. The TMP Manager forms a TMP team including, at a minimum, representatives from the Department's Divisions of Construction, Maintenance, Project Management, and Traffic Operations for each of the affected Districts. The District PIO and CHP participate as needed. The initial meeting is held several months in advance of construction to set milestones, and to allow time to prepare and distribute project information.

During TMP implementation, the TMC serves as an information clearinghouse and coordinates operations. The TMC helps identify conflicts and recommends appropriate action. When provided with accurate and up-to-date lane closure information, the TMC provides real-time traffic information via electronic media, PCMS, and HAR.

The corridor/regional TMP may call for strategies in addition to those provided by the individual TMP for each project. Those elements may include CMS at key locations outside individual project limits, the establishment of an information hotline, Web sites for all projects involved, use of the statewide 511, and the use of TMCs as a central reporting hub.

If the corridor/regional TMP calls for strategies beyond the individual project TMP, it is recommended that:

- The service be provided through a Construction Change Order on one of the corridor projects.
- The requirement be included in one of the corridor projects as part of the project plans and standard special provisions.

2.1.2 TMP Team

For Major TMPs, the TMP Manager solicits team members based on the projects proposed TMP elements, and anticipated traffic impacts. The TMP team may include representatives from the following:

- Divisions of Design, Project Management, Construction, and Traffic Operations.
- Local law enforcement, transit, and emergency services agencies.
- FHWA and CHP.
- District transit representative, District bicycle and pedestrian coordinator, and field staff from the Division of Maintenance.
- Other entities as appropriate.

2.2 TMP IN THE PROJECT INITIATION DOCUMENT PHASE

The extent of a TMP is determined by the District TMP Manager during the preliminary studies of a capital project. At the request of the project initiating unit (typically Design or Planning), the TMP Manager coordinates the preparation of TMP information that will be included in the PID phase. Projects are generally programmed, budgeted, and scheduled upon project approval at the end of the PID phase. It is extremely important to identify the proper scope and cost of the TMP activities in the PID, as significant post-PID approval changes will be difficult to obtain.

As soon as possible and prior to PID approval, the initiating unit sends conceptual geometrics to the District Office of Traffic Operations for evaluation. The TMP Manager and the DTM estimate the extent of the TMP required and determine whether potential traffic delays are anticipated that cannot be mitigated by traditional traffic handling practices or well-planned construction staging.

2.2.1 TMP Datasheet Preparation

During the PID process, the TMP Manager coordinates the development of the TMP datasheet. The datasheet identifies the proposed TMP strategies that may be included to minimize the traffic impacts of the planned work (see Appendix E). Contact your District TMP Manager to identify the information that will be needed.

For all TMPs, an itemized estimate of the proposed strategies and their respective costs may be included in the TMP for proper funding consideration. If an itemized estimate is not included, the TMP Manager should review the project cost estimate prepared for the PID.

2.2.2 TMP Cost Estimate

A TMP cost estimate should be developed for each alternative being considered and should not be based only on the project cost. The cost of a TMP could range from a small percentage of project cost to 20 percent or more and often is not dependent on the size of the project. The cost of the TMP strategies should be weighed against the potential delay savings that the motorists might experience, as well as mobility and safety effects on all modes of travel.

Further guidance can be obtained from the Department's Project Development Procedures Manual.

2.3 TMP DURING THE PROJECT APPROVAL AND ENVIRONMENTAL DOCUMENT PHASE (PA&ED)

During this phase, studies of the identified alternatives are performed to determine the preferred TMP alternative. During the development of the project concept and staging, the Division of Design has the opportunity to incorporate traffic considerations that could potentially eliminate the need for extensive and expensive TMP strategies. During this phase the highest level deliverables completed are the Final Project Report and the Final Environmental Document.

2.3.1 TMP Refinement During the PA&ED Process

The planning or design team should work with traffic engineering/operations personnel and other relevant technical specialists (such as right-of-way experts, pavement engineers, and environmental specialists) to obtain the necessary project information and help identify potential issues or concerns. This collaboration can help to develop the best combination of design, construction phasing/staging, and work zone management strategies. With proper planning, potential traffic problems can be eliminated by modifying the design or construction phasing.

If traffic studies are needed to develop TMP strategies, these should be initiated as soon as possible to make sure that the needed data is available. As information becomes available during the PA&ED phase, the preliminary scope and cost of the overall TMP and the individual elements should continue to be refined. The TMP Manager (or TMP team for a major project) will coordinate the TMP strategies with the project engineer and appropriate functional units, with each team member handling their area of expertise. For major projects, subcommittees or task forces may be formed to handle the planning, implementation, monitoring, and evaluation details of specific elements. The TMP Manager will keep the Project Manager and District Construction Coordinator updated and must sign off on the TMP datasheet of the project report.

It is appropriate at this point to develop a schedule for major TMPs. Many TMP elements may be bid and constructed or initiated separately from the project or may be included in the project plans and installed or implemented as the first order of work. On major capital projects, public awareness campaigns may need to be initiated well before the actual work begins, oftentimes a year or more in advance. For example, if new park-and-ride lots are necessary for the ridesharing element, the planning phase would have to be extended for several months and a design phase added.

An additional activity involves analyzing the existing traffic volume and user mix (such as pedestrians, bicyclists, trucks, and buses in the corridor, both on the freeway and surface streets). This will provide a basis for establishing the goal of the TMP, that is, the number of vehicles that should be removed from the freeway, and in determining the capability of the surrounding surface streets to handle the additional vehicular demand and the impact on bicycle and pedestrian traffic. Assessing transit alternatives available and considering service enhancements may decrease the need for other investments and will show the public that the Department encourages partnerships with transit agencies.

2.4 TMP DURING THE PLANS, SPECIFICATIONS AND ESTIMATES (PS&E) PHASE

The Project Engineer should coordinate with the TMP Manager to ensure that all TMP requirements are addressed in the Standard Special Provisions (SSPs), Engineer's Estimate, and project plans.

2.4.1 Preparation of TMPs During Design

During project design, the TMP strategies may be further developed or modified by the TMP Manager as the details of the work become more specific. Design engineers should consider work zone impacts in the evaluation and selection of the project alternatives. For some projects, it may be possible to choose a design alternative that alleviates many work zone impacts. These broader strategies cross various disciplines and highlight the need for a multidisciplinary approach. As the design progresses, a selected alternative is typically chosen and the TMP is reviewed and updated to reflect the most current project information. During this time the highway historical conditions and current traffic volumes are evaluated to determine the anticipated traffic impacts during construction and to verify that the appropriate TMP strategies are being proposed.

The TMP Manager receives input from the other Divisions that may be involved on the Project Development Team or the TMP Team if one is established. The other Divisions on the team would typically include Design, Project Management, Construction, Traffic Operations, Maintenance, and the PIO. The team should also include CHP and local agencies that might be affected by the project. When applicable, it is recommended that a representative from Environmental Analysis be included in the Project Development Team.

The Department maintains Standard Plans and Standard Specifications that include generic traffic control plans. Any deviations from those Standard Plans and Specifications (such as detours or special work windows) require the inclusion of specific SSPs or special details in the project plans for TMP-related work that needs to be implemented by the contractor. All TMP-related special details and SSPs or changes to those SSPs must be approved by the TMP Manager. Nonstandard special provisions must be approved by the District Deputy Director of Traffic Operations or designee.

2.4.2 Acceptable Delay Thresholds

Lane requirement charts are prepared based on historical traffic volumes at the specific location. Typically they are prepared so that no congestion will result from work; that is, "zero delay" will be expected. If the project has been shelved, the charts should be

reviewed in case updating is needed. The best available traffic data should always be used to develop the charts. If that data is not available, information on appropriate traffic projections may be obtained from the Planning Division.

Certain activities (such as approach slab replacement) may require more time than allowed by the original lane requirement charts. In those instances, the Design Engineer should contact the Engineer of Record (the group that developed the charts) to request a longer work window. If that individual determines that minimal delays would be acceptable based on current traffic conditions, the charts may be adjusted to provide a longer work window. The TMP would then need to be modified to mitigate the traffic impacts created by the longer work window.

2.4.3 Construction Work Windows

Congestion in work zones with high traffic volumes is typically minimized by only allowing work to be conducted during off-peak commute periods. For example, in urban areas, peak hours might occur between 6 a.m. – 10 a.m. and 3 p.m. – 7 p.m. during weekdays. Peak hour traffic volumes during weekdays do not allow for adequate day work windows; certain highway work activities often can only be done at night. Night work that involves noisy equipment and operations could create a nuisance for residential housing nearby; pile driving during working hours could also be a nuisance for businesses in the area.

Through TMPs, the Department strives to strike a balance between reducing the overall construction duration, minimizing disruption to the traveling public, and maximizing safety in the work zone. DD-60-R1 states that, when possible, the maximum allowable delay at any location at any time should be limited to less than 30 minutes. Application of this criterion has resulted in a general shift from day work activities to night work, particularly for capital projects.

This strategy has been successfully implemented in general. However, its effectiveness has been questioned in circumstances where materials or methods require day work conditions or where longer work windows are required to complete certain activities. Overall delay over an extended construction period could have significant impacts on the traveling public, as well as on commercial interests in the project area.

Alternative construction strategies and work windows should be considered early in the design phase, for example, during the Project Development Team process. These alternatives might include:

- Extended closure options:
 - 55-hour weekend closures (typically from 10 p.m. on Friday until 5 a.m. on Monday).
 - 72-hour weekday closures.
 - Continuous closures (for example, 10 days including weekends).
- Full closures in one direction.
- Full facility closures (in both directions).
- Closed facility for all vehicles except for buses.

Extended work windows and full closures often provide a shorter project duration, which in turn may result in cost savings and in overall delay savings to the traveling public. The time

for setting up and breaking down traffic control and construction equipment mobilization is reduced, resulting in more effective work time. For example, in 2006 the Interstate 15 Devore Pavement Rehabilitation Project team opted for a continuous nine-day closure of the full facility (alternately in each direction) rather than six months of night work. These alternatives also enhance safety.

Projects with the following characteristics might be likely candidates for full closures:

- Projected night time or weekend closures, indicating the potential for significant delay.
- Available alternate routes or ability to increase transit service, or both.
- A significant reduction in the number of working days.
- Sufficient lead time available for TMP development, specifically focusing on a public information campaign.
- Willing partners at the local and regional levels.
- Possibility of mitigating impact of major special events, holidays, or other major traffic generators.

Use of alternative work windows must include consideration of the need for revised or additional public awareness strategies. The District PIO should be included when determining which strategies are needed and the appropriate timing for implementation.

Use of alternative work windows or extended work windows beyond the lane requirement chart hours must also include consideration of the need for monitoring traffic flow approaching the work zone to protect motorists approaching the “end of queue.” These queues can often result in secondary traffic collisions (usually rear-end collisions) when motorists fail to slow down. This monitoring can be done by the contractor or a District Traffic Management Team.

If the work methods cannot be modified or avoided, select the least detrimental period and be sure to notify the public why the work is necessary and when it will occur.

2.4.4 Pedestrian and Bicycle Traffic

Work zone activities can disrupt the public’s mobility and access. Temporary lane restrictions, use of shoulders as travel lanes, detours, and other transportation management strategies should be designed to accommodate nonmotorized travelers wherever they are legally permitted. Safe and convenient access should be maintained for pedestrians and bicyclists, who are susceptible to disruptions because of their slower speeds and sensitivity to noise, airborne dust, road debris, and fumes. Special care should be taken to consider areas where schools or senior citizen centers are located. A travel path that replicates, if possible, the most desirable characteristics of their usual travel route should be provided.

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA)) through a Temporary Traffic Control (TTC) zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents. The California Manual of Uniform Traffic Control Devices (MUTCD) Part 6 contains figures that can be adapted for traffic handling plans. Figure 6H-29, “Crosswalk Closures and Pedestrian Detours,” of the California MUTCD is an example of accommodating the needs and control of pedestrians. Public participation should be

used to ascertain the extent of public impacts of proposed construction activities and to discuss the appropriate temporary accommodations that can be reasonably achieved.

DD-64-R1 - Complete Streets - Integrating the Transportation System requires full consideration of nonmotorized travelers (including pedestrians, bicyclists and persons with disabilities) in all programming, planning, maintenance, construction, operations, and project development activities and products.

Design Information Bulletin 82 - Pedestrian Accessibility Guidelines for Highway Projects provides highway design guidance to accommodate persons with disabilities within the public rights-of-way. This document satisfies the requirements of the ADA. SSP 12-150 contains details on pedestrian walkway materials and construction. Further guidance for pedestrian and bicyclist accommodations is provided in the California MUTCD, Part 6 “Temporary Traffic Control.”

California MUTCD Part 6 addresses the needs and control of all road users (motorists, bicyclists, and pedestrians) within the highway, including persons with disabilities in accordance with the ADA, through a TTC zone. The TTC shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

2.4.5 Transit Services

In preparing a TMP, the team should meet with local transit providers to understand existing transit services, to ensure the transit level of service remains at an acceptable rate, and entice commuters to use this transportation mode. Higher transit ridership leads to a decrease in the number of vehicles the Department must accommodate during project construction.

2.4.6 TMP Certification

When preparation of the PS&E package is complete and the project is Ready to List (RTL) for bid, certification that all the latest TMP strategies are included must be obtained from the TMP Manager. If the project is shelved, the TMP strategies need to be reviewed, updated, and recertified before RTL.

2.4.7 Retrofitting TMPs for Programmed Projects

Generally, the extent of the TMP is determined prior to programming (PID approval). However, it may be necessary to retrofit a TMP to a project that is already programmed due to project changes, policy changes, emergencies, or unforeseen conditions. These projects must be handled on a case-by-case basis since the course of action will depend on how far along the project development process is and how extensive the TMP needs to be. A project that was initially designed to be constructed as a night time operation over several months may be converted just prior to construction to a full closure or a continuous closure to reduce the overall project duration. The Interstate 15 Devore project is an example of continuous closures implemented over a nine-day period in each direction of travel, rather than several months of night closures.

2.5 TMP MODIFICATIONS DURING CONSTRUCTION

Contract-related TMP strategies are implemented by the contractor with Department oversight. Strategies related to public awareness may also be implemented by Department personnel. If project conditions change, traffic volumes increase or project staging changes, the DTM or the TMP Manager must be notified and consulted to determine if the TMP needs to be revised. The District PIO also needs to be involved early in the planning phase to ensure adequate public awareness funding will be available throughout the project.

At times, certain activities may require more time than allowed by the lane requirement charts. In those instances, the Registered Engineer (RE) should contact the Engineer of Record (the group that developed the charts) or DTM and TMP Manager to request a longer work window. If that individual determines that minimal delays would be acceptable based on current traffic conditions, the charts may be adjusted to provide a longer work window. When work is allowed outside of the original work window, the District Transportation Management Team (TMT) should be contacted to monitor potential traffic backups.

2.5.1 Traffic Monitoring During Construction

The RE should ensure that inspectors monitor traffic conditions while work is being performed to avoid impacts in excess of what was identified in the TMP. When excessive queues occur, the TMC should be notified to initiate mitigation.

When congestion due to highway work zone activities is anticipated, traffic monitoring can be made a part of the construction contract or conducted by District TMT personnel. The traffic monitor typically uses a vehicle with a truck-mounted CMS and stations the vehicle where approaching motorists can clearly read the CMS. This strategy provides periodic assessments of the effectiveness of project safety features and is often done at the beginning of a project to make sure that the TMP strategies are effective. Electronic monitoring and warning systems can also be used for this purpose.

2.5.2 TMP Coordination During Construction

TMP activities are to be monitored and evaluated by the TMP Manager or the TMP team and those elements found ineffective should be appropriately modified.

During construction, those TMP elements that are part of the main contract or Encroachment Permit are implemented under the general direction of District Construction or Encroachment Permits. Those separate contracts or agreements, for example, for rideshare and transit activities and public awareness campaigns, will be under the direction of their respective contract managers.

Special effort should be given to assure that CMS, HAR, and other media tools provide accurate and timely information to motorists, bicyclists, and pedestrians regarding lane closure times and locations.

2.5.3 Late Lane Closure Pickup

The RE needs to ensure that lane closures will not be picked up beyond the lane closure window. Exceptions can occur when the activity needs to be completed for the safety of the public and workers. The RE should coordinate with the DTM if the contractor needs to work outside the lane requirement chart hours. The TMC should also be notified and the TMT may need to be called to monitor possible queuing.

In order to avoid significant traffic impacts, it is essential to monitor and respond immediately to delay, pick up closures on time, and have solid traffic handling and contractor (construction operations) contingency plans.

Contractor compliance with lane closure pickup deadlines can be enforced in two ways. SSP 12-220 is often included in the contract allowing the contractor to be assessed for damages based on the value of traffic delay when the contractor exceeds the lane closure window. The minimum damages are generally \$1,000 per 10 minutes, but the damages can greatly exceed the minimum, depending on traffic volumes and the highway facility. Traffic Operations staff (normally the DTM) calculates the delay damages during PS&E. The second method to ensure that the lane closures are picked up on time is for the RE to suspend the contract work.

A contractor or departmental forces (such as Maintenance) can be ordered to pick up a lane closure early if traffic impacts become significant either due to a project incident or activities outside the project area. During construction, remedial actions may be based on contingency plans submitted by the contractor. Early pickup should only be ordered when traveler and worker safety will not be compromised. The SSPs for “maintaining traffic” for capital projects provide for compensating contractors for early pickup. Encroachment Permit provisions require the permittee to pick up a closure early without compensation.

A Department staff member who can make informed decisions about implementing contingency plans and modifying, terminating, or extending approved lane closures should be available to respond to significant delays and other unexpected events whenever lane closures are in place. The designated employee(s) may be Traffic Operations, Construction, or TMC staff, depending on the District.

2.5.4 “After-Action” Reporting

At the end of a major project, where the actual delay exceeded the threshold set by the DTM, the District LCRC or HQ LCRC may request that a brief “After-Action” (post-TMP) report be completed by the TMP Manager (for example, the San Francisco-Oakland Bay Bridge Labor Day closures in District 4). Post TMP meetings with the CHP and other partners can be held to identify the elements that went well and those that could have been done differently. Samples of past “After-Action” reports can be obtained from the individual District Traffic Operations offices.

2.6 CONTINGENCY PLANS

There are two types of contingency plans. The “Construction Operations Contingency Plan” is developed for the purpose of construction operations equipment and materials backup; the second plan developed by the Division of Traffic Operations is referred to as the “Traffic Handling Contingency Plan.”

2.6.1 Construction Operations Contingency Plan

The contingency plan is developed by the contractor to identify operations, equipment, processes, and materials that may fail and cause delayed opening of lane closures. The contingency plan identifies alternative or additional equipment, materials, or workers necessary to ensure continuing operations and on-time opening of closures when a failure occurs. If the alternative or additional equipment, materials, or workers are not on site, the contingency plan specifies the method of mobilizing these items and the required time to complete the mobilization.

Critical pieces of equipment are those that are necessary to complete the planned work in the closure, for which no close on-site substitutes exist, and which, if rendered inoperative, would cause the closure to have to be kept in place past the pick-up time indicated in the requirement charts.

Critical work operations are any work to be performed in a lane, shoulder, or ramp closure that will render any portion of the traveled way unsuitable for use by public traffic, or that would make the use of the traveled way unsafe, and would therefore cause the closure to remain in place past the pick-up time indicated in the lane requirement charts.

As the SSP is written, the RE determines when the contractor will be required to submit a contingency plan. The contractor develops a contingency plan and submits the plan within one day of the RE request. The contingency plan should be discussed at the partnering meeting or at the project preconstruction meeting.

The following list provides samples of operations that may require a contingency plan:

- Slab replacement
- Roadway excavation
- Cold planning asphalt concrete
- Asphalt paving
- Asphalt or concrete grinding
- Chip seal
- Asphalt or concrete pavement sealing operations
- Bridge work
- Placement of reinforcing steel or structural members
- Erection of falsework
- Bridge demolition
- Striping

The Construction Operations Contingency Plan describes:

- Critical stage for each operation when the alternative or additional equipment, materials, or workers are to be activated.
- Communication equipment (cellular telephones) and procedures to be followed when communicating with the RE's field representative(s) during activation of the contingency plan.
- Intended amount of work to be done during each lane, shoulder, or ramp closure. The amount of work is described in terms of length, width, and unit of measure conforming to the appropriate progress pay items.
- Operation work schedule with a time line set at 20 minute intervals.
- Contractor plans to comply with the projected material delivery rates to the jobsite. Material delivery may be delayed due to various factors including, but not limited to, plant breakdown, loss of trucking due to breakdown, independent truckers leaving to another job, or trucking delayed by traffic congestion due to accidents or the project itself.
- Times for beginning and ending critical work operations for work being conducted in lane, shoulder, or ramp closure.
- A general time-scaled logic diagram displaying the major activities and sequence of planned operations that comply with the requirements of these special provisions and a set of "contingency action plans" for each stage of the operations to prevent late opening of the traffic lanes shall be specified. "Early finish" and "late finish" milestones shall be clearly identified for every major activity. The "contingency action plans" shall include detailed operations that will be conducted should a major activity pass the "late finish" milestone.
- Anticipated cooling times for asphalt concrete pavements necessary prior to opening a lane, shoulder, or ramp to public traffic.
- Anticipated time it will take to completely pick up the lane, shoulder, or ramp closure(s) rounded to the nearest 5 minutes.
- Anticipated time(s) for beginning pickup of lane, shoulder, route, or ramp closure(s).
- Timelines for the contractor and the RE to meet at the worksite to review actual progress and forecast the time work will be stopped to open the lane, shoulder, ramp, or route to public.

The contractor verifies or updates the contingency plan concurrent with submission of the written schedule of planned closures. If a revision is required, the contractor should not close any lanes until the contingency plan has been reviewed by the RE.

2.6.2 Traffic Handling Contingency Plan

The Traffic Handling Contingency Plan is a method of operation consisting of strategies or actions taken to restore or minimize effects on traffic when the congestion or delay resulting from construction, maintenance, or permit activities exceeds original TMP estimates. This situation may result from unforeseen events such as work zone incidents, higher-than-predicted traffic demand, or late lane closure pickups.

These traffic handling contingency strategies may include, but are not limited to, the following:

- Notification to the TMC
- Request for TMT assistance
- Activation of CMS or PCMS
- Activation of the HAR system
- Notification to the CHP
- Notification to transit agencies
- Notification to the media
- Activation of a detour
- Follow-up with the RE if activation of the contractor's (construction operations) contingency plan is appropriate
- Notification to the HQ Communication Center if the District TMC is not available

Depending on the District or the situation, these strategies may be implemented by the DTM, the Construction Traffic Manager, or the TMC.

On lane closures that will be implemented outside of typical lane closure hours and that are expected to have significant traffic impacts, the Project Development Team or TMP Team should develop a specific traffic handling contingency plan that may include:

- Activation of a TMT when available to monitor congestion and queues.
- Trigger points to identify when certain traffic handling strategies should be taken.
- "Decision tree" with clearly defined lines of communication and authority.
- Specific duties of all participants during lane closure operations, such as coordination with CHP or local agencies.
- Names, telephone numbers, and pager numbers for the DTM or their designee, RE, Maintenance Superintendent, Encroachment Permit Inspector, on-site traffic advisor, CHP Division or Area Commander, and appropriate local agency representatives. (One means of disseminating this contact information would be via the COZEEP/MAZEEP Pocket Guide (see Appendix B), which should be prepared for individual projects.)
- Coordination strategy (and special agreements if applicable) between DTM, RE, on-site traffic advisor, Maintenance, CHP, local agencies, and the Office of Public Information.

3.0 TMP ROLES AND RESPONSIBILITIES

DD-60-R1, released in September 2007, clearly defines the roles and responsibilities of Department personnel involved in the TMP process, including:

- District Directors
- Chief, Division of Traffic Operations
- Deputy District Directors of Construction, Design, Project Management, Maintenance and Traffic Operations
- Chief District Public Information Officer (PIO)
- District Lane Closure Review Committee (LCRC)
- HQ LCRC
- District TMP Managers
- District Project Managers
- District Traffic Manager
- District Design, Office Engineer, Maintenance, and Encroachment Permit Engineers
- District Construction Engineers, RE, Encroachment Permit Inspectors, and Maintenance Supervisors/Superintendents
- Construction Traffic Managers
- TMC Staff

DD-60-R1 is included in this document as Appendix A.

4.0 LANE CLOSURE REVIEW COMMITTEE

4.1 SIGNIFICANT TRAFFIC IMPACTS AND MAJOR LANE CLOSURE APPROVAL BY THE DISTRICT LCRC

This process applies to all “major” lane closures on the State Highway System. Major lane closures are those lane closures that are expected to result in significant traffic impacts despite the implementation of TMP strategies. A “significant traffic impact” is defined in DD-60-R1 as a delay of 30 minutes or more above normal recurring traffic delay on the facility, but may also refer to work that may affect traffic conditions over a long period. When a planned lane closure is expected to have a significant traffic impact, District LCRC review and approval are required. The functional unit directly involved in the work must submit the major lane closure request to the District LCRC for approval as detailed below. The District LCRC is comprised of the Deputy District Directors of Construction, Design, Maintenance, and Traffic Operations, and the District PIO. The CHP may also need to participate as appropriate.

The District LCRC does not have to review and approve emergency closures due to natural events or incidents. However, the TMC and the DTM must be notified, and every effort must be made to minimize traveler delay and reopen traffic lanes as soon as practical.

4.2 HQ LCRC REVIEW

The District LCRC will decide when to submit lane closure requests to the HQ LCRC for their review and recommendations or approval. The District LCRC would usually consider lane closures that are of an interregional, statewide, environmental, or otherwise sensitive nature. The District LCRC is expected to resolve most issues at the District level with the focus on mitigating delay over 30 minutes or developing full or extended closures that would reduce overall traveler delay for projects that may extend for several months or years.

The HQ LCRC is comprised of the Division Chiefs from Construction, Maintenance, Design, and Traffic Operations, along with the Deputy Director of External Affairs, and a representative from CHP. The HQ LCRC may review the closure or leave the decision to the District LCRC. As a notification process, information on planned lane closures that are reviewed by the District LCRC should be provided to the Chief of the Office of System Management Operations.

The Division Chief of Traffic Operations serves as Chair of the HQ LCRC and may refer the decision back to the District or meet first with the District to discuss major concerns before deciding to call the full committee together. A full HQ LCRC review is only warranted in rare circumstances (for example, full closure of the San Francisco-Oakland Bay Bridge in the eastbound direction over Labor Day Weekend 2006).

If the District is confident that the necessary TMP strategies are planned and will be implemented when needed, it is not necessary to request a meeting with the HQ LCRC. The District LCRC, however, should prepare adequate information (one-page or two-page fact sheet) so that the District Director can inform the Director of the steps being taken to minimize potential traffic problems for those projects that may be press worthy.

In its evaluation of the proposal, the District LCRC will give consideration to the accuracy, reliability, and completeness of information provided, as well as other reliable sources of information available to the District LCRC.

Proposals will be evaluated on the basis of effectiveness in the following areas:

- Traveler and worker safety improvements.
- TMP strategies.
- Plans for coordination with adjacent construction, maintenance, encroachment permits, and special events activities.
- Plans for coordination with TMC and field personnel.
- Plans for coordination with public media.
- Plans for use of existing field elements such as traffic surveillance loops, CMS, HAR and CCTV cameras.
- Lines of communication and authority (top to bottom).
- Plans for monitoring delay (or corresponding queue length) during lane closure operations.
- Alternatives to proposed closures.
- Contingency plan viability.
- Plans for coordination with local agencies, particularly as strategies pertain to detours on local roadways.
- Plans for coordination with the trucking industry on routes with heavy truck traffic.
- Transit agency coordination plan.

4.3 CONTENTS OF MAJOR LANE CLOSURE REQUEST SUBMITTAL

The functional unit that plans to request the lane closure and is responsible for its performance prepares a major lane closure request submittal with support from the TMP Manager and the DTM. Sufficient information is provided to ensure complete understanding of the proposal. At a minimum, the following information is recommended:

- Location and vicinity maps showing the State highway(s), local street network, and other adjacent lane closures or nearby work that may affect traffic during the same period, including special events.
- Dates, times, and locations of the lane closure(s).
- Brief description of the work being performed during the lane closure(s).
- Brief description of each lane closure and its anticipated effect on traffic conditions and transit services.
- Amount of expected delay and corresponding queue length for each lane closure.
- Summary of TMP strategies that will be used to reduce delay and motorist inconvenience during the lane closure(s). A copy of the approved TMP for the project, if available.
- Detailed detour information if applicable.
- Construction operations contingency plan.
- Map of transit routes in pedestrian/bicycle facilities.

5.0 TMP EVALUATION PROCESS

5.1 TMP STRATEGY EFFECTIVENESS

Monitoring traffic impacts during highway work should help determine how well or poorly the TMP strategies are performing and if the TMP strategies have been properly implemented. Field personnel should observe traffic conditions to determine if the actual impacts comply with the Department's policies and fall within a reasonable range of the impacts that were expected. Monitoring strategies may involve manual traffic volume counts, surveys using "floating cars" to assess travel time through the work zone, or automatic measuring devices. Record keeping on project events and traffic incidents (collisions and traffic queues) may also serve as good sources of information.

The RE, DTM and TMP Manager should determine whether the implemented strategies are reaching the predetermined goals for reducing congestion within reasonable cost limits. If an element's predetermined goal is not immediately reached during implementation, but there is a general trend toward meeting that goal, the element can remain in effect but may be modified as appropriate. Elements that show no sign of approaching their predetermined goals as determined by the TMP Manager should be revised or dropped and other actions may be needed to minimize congestion through the work zone.

The effectiveness of TMP strategies can be evaluated through various ways:

A. Field Counts and Surveys

- Field measurements of actual delay to the public (through electronic or manual data collection).
- Field observation of congestion queues by Department TMT personnel or by the contractor.

B. Public Surveys

- Questionnaires regarding how and when the public found out about the work.
- Logging of public complaints on Department Web pages or through telephone calls.

C. TMP Effectiveness Checklist Reporting on Factors, such as:

- The actual delay experienced
- Additional travel time
- Queue length
- Number of incidents in or near the work zone
- Incident response
- Impacts on adjacent construction activities
- The number of times that planned lane closures were picked up late and the reason
- Delay to transit services and ridership impacts
- Delay to bicyclists and pedestrians.

5.2 POSTCLOSURE EVALUATION STATEMENT

A Postclosure Evaluation statement may be submitted to HQ Division of Traffic Operations, Office of System Management Operations, on projects that cause major delay. Typically, the majority of postclosure evaluation statements are prepared for closures formally approved by the District LCRC under this process. However, any delay over 30 minutes should trigger a postclosure evaluation statement.

No more than one page is suggested. The functional unit performing or overseeing the lane closure will prepare the statement within five working days of the date the lane closure exceeded the threshold criteria. The statement should explain the following:

- The cause and impact of delays.
- Either actions taken or to be taken to avoid or mitigate an occurrence or recurrence.
- Why the expected delay was exceeded and why it was necessary to exceed the closure window.
- How the situation can be avoided in the future.

5.3 TMP PROCESS REVIEW

The objective of the process review is to evaluate statewide TMP practices and strategies and use the results to guide improvements in the Department's policies and procedures regarding safety and mobility. These reviews may include the evaluation of work zone data at the State level or field observations of selected projects. The information gathered is typically brought to the attention of the DTMs and the TMP Managers. They may analyze and review the information and make recommendations to revise policy or standard specifications, identify training needs, or update guidelines if needed.

By reviewing possible trends, the Department may determine that some adjustments to its practices would be appropriate, such as changes to standard design specifications. For example, during a process review, a DTM or TMP Manager might determine that work zone traffic delays in one part of the region have been more than experienced in the past and may warrant modifications in permitted lane closure times. During a process review, the Department may review its training requirements to determine whether they are still adequate.

The DTMs and TMP Manager's throughout the State meet twice a year to discuss ongoing issues relating to traffic management. These meetings address evaluations of traffic management strategies for work zone activities. Presentations are often given on strategies that have been used on past or current projects, whether or not those strategies were effective, and lessons learned. Discussions are held on proposed projects and strategies; feedback is provided by the various Districts on whether these strategies might be improved or modified. The review process may include changes to strategies on a statewide basis for future work zone activities. Some of the issues that have been recently addressed include the effectiveness of COZEEP and MAZEEP, monitoring the end of queue during construction, damages assessed for late lane closure pickup, construction and traffic handling contingency plans, flexible work windows, and the use of truck-mounted attenuators for lane closure installation and removal.

Department personnel from Construction, Maintenance, PIO and Traffic Operations, as well as representatives from FHWA, CHP, universities, consultants, contractors, suppliers, and local agencies participate on a joint Work Zone Safety Committee. This committee meets quarterly to address safety and mobility issues and makes recommendations to influence policy.

The Division of Construction conducts ongoing reviews of construction practices on randomly selected projects. The Division of Construction publishes a report entitled the Contract Administration Process Evaluation every four years. Example issues that have been addressed in recent years include work zone safety equipment and apparel, construction contingency plans, A+B bidding practices, construction methods, and flexible work windows.

Construction safety meetings are held twice a year to discuss work zone safety issues and make recommendations to improve policy and specifications, to modify the construction manual, and to improve work zone training. Other topics have included discussions on collision data and changes that may be needed in work zone practices to improve safety.

6.0 TMP TRAINING

6.1 TRAINING PROGRAM AND MATERIALS

TMP training courses are conducted in all 12 Districts throughout the State. The training program and materials were initially prepared by Capital Project Skills Development (CPSD) and the Office of System Management Operations staff and have been modified and updated by the Districts to reflect their own issues. This eight-hour course consists of several PowerPoint presentations and videos, as well as technical handouts and interactive class exercises. The subject matter includes the TMP process, strategies, and roles and responsibilities.

The course is conducted by the District TMP Manager and DTM staff, with the assistance of the HQ TMP coordinator and the CPSD coordinator as required. Course materials can be found at:

http://onramp.dot.ca.gov/hq/traffops/otrafopr/system_development/tmp.htm

6.2 TARGET AUDIENCE

TMP training is mandatory for all statewide personnel directly involved in the TMP process, generally, the Divisions of Planning, Environmental Analysis, Design, Program Management, Traffic Operations, Maintenance, and Construction.

7.0 TMP FUNDING AND PROGRAMMING

7.1 TMP CHARGING PRACTICES

When identifying funding for various TMP elements, it is important to distinguish between capital outlay costs and capital outlay support (COS) costs. Work done by District staff for the planning and design of TMP activities for capital projects is a normal part of the project development process and should be captured as capital outlay support. The TMP Manager and each functional manager should work closely with the project manager to ensure that TMP activities are included in all project work plans.

TMP support activities to consider include ridesharing programs, Freeway Service Patrol (FSP), public awareness campaigns, parallel route improvements, temporary bicycle and pedestrian facilities, and the Request for Proposal (RFP) process up to award of the contract. Some of these activities may also have a capital component in addition to the support component discussed here.

The workload required to develop and implement TMPs is estimated in advance. Workload hours for TMP activities must be included in the COS project's work plan in order to be resourced (funded) by COS. These activities should then be charged to each project's expenditure authorization (EA) number, using the appropriate Work Breakdown Structure (WBS) code for that stage of the project. TMP-related work should be charged only to the WBS codes reserved for those activities. These codes can be found on the Department's Division of Project Management's intranet site in a document entitled "Guide to Project Development Workplan Standards".

Work performed by District staff for implementing TMP elements during construction of capital projects is also a normal part of the project development process. Again, workload (hours) for implementing TMP activities must be included in the project's work plans to be resourced by COS. These activities should then be charged to the appropriate project's phase 3 EA, and WBS code, that is, 270 (Perform Construction Engineering and Contract Administration), 270.65 (TMP Implementation during Construction).

Some funds necessary to implement TMP elements not done by staff, including consultant contracts, can be sourced from capital outlay funds allocated by the California Transportation Commission (CTC) as itemized in the plans, specifications, and estimates. Various TMP elements, such as parallel route improvements and HAR, could be a phase of the construction contract or separate construction contracts while others such as public awareness campaigns and transit subsidies must be separate contracts or cooperative agreements.

The TMP elements that need to be in place prior to start of construction are identified and funded as stage construction or first order of work under a single package presented to the CTC. Service contracts such as those for public service or consultant contracts, information campaigns, or establishing telephone hotlines must be arranged separately with consultants and other providers. For most projects, it takes four to six months to obtain a service contract. This means that all consultant contracts have been advertised, the consultant selected, and the contract ready for signature and awarded immediately following CTC allocation of funds. Other activities such as parallel route improvements are usually included in the main construction contract and as a first order of work under a cooperative agreement.

In some cases, the CTC can be petitioned to fund a portion of the TMP as an initial phase of the main project. This is usually for a high-priority project where plans, specifications, and estimates for the main project are not finalized, but early funds are needed to initiate TMP activities such as making transit arrangements with local governments. The petition to fund an initial phase comes from the District, explaining why a portion of the project must proceed before funding for the main project is allocated. These early funds reduce the programmed funds for the main project accordingly.

The FHWA supports the TMP concept and views major reconstruction projects as an excellent opportunity to initiate continuing TMP strategies that provide improved traffic operations long beyond the completion of work.

7.2 CHARGING FOR MAINTENANCE AND ENCROACHMENT PERMIT TMP ACTIVITIES

TMPs and contingency plans for Encroachment Permit projects are developed by the permittee or by Department staff. Staff time for development, review, and implementation of TMPs for Encroachment Permits is charged to the permit. Maintenance normally develops TMPs for its projects. Maintenance and staff from other functional areas that expend time on a Maintenance TMP charge to the designated Maintenance EA. The Office of Public Information should be notified on all Encroachment Permit TMP and contingency plans to ensure proper expenditure charging.

7.3 FREEWAY SERVICE PATROL FUNDING

The Freeway Service Patrol (FSP) is a congestion relief program of roving tow trucks operating in most metropolitan and some rural areas. The FSP program is operated by Regional Transportation Planning Agencies (RTPAs) with funding from the Department. The Department also reimburses CHP for training and supervisory services provided for the FSP. The RTPAs contract with tow companies for commute time service and some weekend and mid-day service to assist motorists with simple repairs (for example, flat tire or one gallon of gasoline) or tow the automobile from the highway.

FSP is available for incident management during construction. However, construction-related FSP service needs to be funded as part of the TMP. A cooperative agreement with the RTPA is required, outlining the services provided and the fund transfer. An interagency agreement with the CHP is also required for any support services (field supervision and dispatch operator services). These agreements should be initiated with the RTPA and the CHP as soon as it is determined that FSP should be in the project TMP.

The Department's HQ Division of Traffic Operations no longer initiates Master Agreements with the RTPAs for future FSP services. The Master Agreement is developed at the District level, usually by the TMP Manager. Having a Master Agreement in place will simplify the process for both the Department and the RTPAs by eliminating the need for a cooperative agreement for each project. Only a task order form will be needed for each project. A similar agreement is handled at HQ with the CHP. A simple task order can be completed by the District for CHP supervision funded by the construction project. Please contact HQ Division of Traffic Operations, Freeways Operations Branch for more information.

7.4 COZEEP AND MAZEEP FUNDING

The Department has contracted with CHP to provide enhanced enforcement services in work zones through the COZEEP and the MAZEEP. CHP is the sole provider of these services. On oversight projects, the local agency typically contracts with the CHP to provide these services. Contact CHP, Special Projects Unit, for more information at webmaster@chp.ca.gov.

7.5 BASIC ENGINEERS ESTIMATE SYSTEM (BEES) ITEM CODES

Those TMP elements that are not part of the main contract, but are identified as Capital Outlay costs tied to the main project, should be itemized as State Furnished Materials and Expenses using the appropriate BEES item cost (see Table 7.1).

TABLE 7.1 TMP BEES ITEM CODES

066003	State-Furnished Materials
066004	Miscellaneous State-Furnished Materials
066005	Concurrent Work
066006	Miscellaneous Concurrent Work
066008	Incentive Payment
066009	Utility Expense
066010	Work by Others
066060	Additional Traffic Control
066061	CHP Enhanced Enforcement
066062	COZEEP Contract
066063	Traffic Management Plan Public Information
066064	Specter Radar Unit
066065	Tow Truck Service Patrol
066066	Public Transit Support
066067	Rideshare Promotion
066070	Maintain Traffic
066072	Maintain Detour
066074	Traffic Control
066076	Temporary Traffic Control
066077	Install Traffic Control Devices
066578	Portable Changeable Message Signs
066825	Temporary Striping
066872	Service Contract
120100	Traffic Control System
128602	Traffic Control System (One Way)
128650	Portable Changeable Message Sign
129150	Temporary Traffic Screen
860793	Telephone Service (Location 1)
860811	Detector Loop
860925	Traffic Monitoring Station (Count)
860927	Traffic Monitoring Station (Incident)
860930	Traffic Monitoring Station
861088	Modify Ramp Metering System
869070	Power and Telephone Service
994920	Bicycle Parking Rack
995000	Bus Shelter

7.6 CHARGE TO OTHER PROJECT PHASE 4 (CONSTRUCTION) FUNDS

Funds from other construction contracts in the District may be used if those projects are in the vicinity of, or will be affected by, the project requiring TMP funds. At the discretion of the Deputy District Director for Construction, a list of chargeable project EAs may be submitted to HQ Division of Accounting for prorated charging.

7.7 LOCAL INVOLVEMENT (SPECIAL-FUNDED PROJECTS)

DD-60-R1 applies to all projects on State facilities, including those not funded by the State. District Directors are responsible for assuring local compliance. Since many measure projects are split funded, the Department and local entities must work cooperatively to develop an effective TMP. The Department is responsible for approving all Project Study Reports, and it is at this point that agreements should be reached concerning the costs and scope of TMP strategies.

The TMP Manager has not always been included in discussions regarding these types of projects and often traffic-handling issues have been set aside until the last minute. The TMP unit is then asked to approve a traffic handling plan that would not be acceptable for a project designed and implemented by the Department. The consultant preparing the lane requirement charts is often unfamiliar with the process and the specification requirements. This results in additional work for the TMP group as well as the DTM. The TMP Manager must be contacted early in the project development phase to ensure that adequate TMP strategies and hours for TMP and DTM tasks are included for special-funded projects.

APPENDIX – A

Deputy Directive – 60-R1

Deputy Directive

Number: DD-60-R1

*Refer to
Director's Policy:* DP-03
Safety and Health
DP-05
Multimodal Alternatives Analysis
DP-08
Freeway System
Management

Effective Date: September 2007

Supersedes: DD-60 (06-15-00)

TITLE Transportation Management Plans

POLICY

The California Department of Transportation (Department) minimizes disruption to the traveling public during construction or other planned activities necessary on the State Highway System. The Department uses innovative means to accelerate completion of highway work activities while taking necessary steps to maintain public and worker safety and the quality of the work being performed.

Transportation Management Plans are required for all planned activities on the State Highway System. Transportation Management Plan measures and associated road user costs and additional construction costs are considered during the project initiation or planning stage to the fullest extent feasible. Transportation Management Plans include strategies that strive to minimize work-related traffic delays while reducing overall duration of work activities where appropriate. Strategies that may result in a net reduction of overall delay for motorists include: full facility closures, extended weekend closures, continuous weekday closures, A+B contract specifications, and performance-based traffic handling specifications.

BACKGROUND

The Department's major emphasis on transportation projects has largely shifted from new construction to reconstruction, operation, and maintenance of existing facilities. With the ever-increasing traffic volumes on California's State Highway System and more complex project corridors, the need to actively manage the State's highway facilities has become critical.

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Deputy Directive – 60-R1

In order to prevent unreasonable traffic delays resulting from planned work, Transportation Management Plans must be carefully developed and implemented to maintain acceptable levels of service and safety during all work activities on the State Highway System.

The Federal Highway Final Rule, 23 Code of Federal Regulations 630, Subpart J, referred to as “Work Zone Safety and Mobility” requires the Department to adopt a policy that implements Transportation Management Plans on all federally-funded highway projects. Transportation Management Plans are to be consistent with the Final Rule guidelines for developing and implementing that policy.

Transportation Management Plans are to be consistent with Deputy Directive-64, “Accommodating Non-Motorized Travel.”

DEFINITIONS

Transportation Management Plan is a program of activities for alleviating or minimizing work-related traffic delays by the effective application of traditional traffic handling practices and an innovative combination of various strategies. These strategies encompass public awareness campaigns, motorist information, demand management, incident management, system management, construction methods and staging, and alternate route planning. Depending on the complexity of the work or magnitude of anticipated traffic impacts, a Transportation Management Plan may provide lane closure charts, Standard Special Provisions for maintaining traffic, traffic control plans, and for a major project, a separate comprehensive report. The Department’s “Transportation Management Plan Guidelines” provide more information on the recommended level of detail for Transportation Management Plans.

Major Lane Closures are those that are expected to result in *significant traffic impacts* despite the implementation of Transportation Management Plans.

Significant Traffic Impact is defined as being an individual traffic delay of 30 minutes or more above normal recurrent travel time on the existing facility. Transportation Management Plan strategies are designed to maintain additional delays below this maximum threshold, i.e. less than 15 or 20 minutes. This 30 minute maximum delay may be exceeded with approval by the District Lane Closure Review Committee.

District Lane Closure Review Committee is comprised of the Deputy District Directors of Construction, Design, Maintenance and Traffic Operations, and the District Public Information Officer (PIO).

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Deputy Directive – 60-R1

Headquarters Lane Closure Review Committee is comprised of the Division Chiefs of Construction, Design, Maintenance and Traffic Operations, and the Deputy Director of External Affairs. The California Highway Patrol (CHP) will be called upon to participate as appropriate at the District or Headquarters Level.

RESPONSIBILITIES

District Directors:

- Enforce Transportation Management Plans and lane closure policies to ensure compliance with established procedures, guidelines, and policies.
- Ensure that resources for all Transportation Management Plan activities are provided.

Chief, Division of Traffic Operations:

- Develops, implements, and maintains statewide policy regarding Transportation Management Plans.
- Provides direction and assistance to District staff on all Transportation Management Plan activities as well as resources for training of District staff involved in Transportation Management Plans.
- Ensures consistency among the Districts on the development and implementation of Transportation Management Plans.

Deputy District Directors, Construction, Design, Project Management, Maintenance and Traffic Operations:

- Require all staff involved in Transportation Management Plan activities to participate in Transportation Management Plan training.
- Ensure that staff involved in highway work activities consider alternatives that will strike a balance between reducing the overall construction duration and minimizing disruption to the traveling public.

Chief District PIO:

- Participates in the project development phase of appropriate projects as determined by the Project Development Team to provide input on the cost of public awareness campaigns, which should be included in the construction contract allotment under State Furnished Materials and Expenses.
- Attends preconstruction or planning meetings as needed and prepare a project plan for community outreach strategies.
- Works with the District Project Manager to ensure that Transportation Management Plan funding for community outreach strategies is planned accordingly as well as expended appropriately, and that personnel time is included in the Work Breakdown Structure for the project.
- Assists or be the lead in implementation of a project's public awareness campaign.

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- Develops and maintains liaisons with the media, affected local jurisdictions and legislators, and other external partners both prior to and during the construction period, as needed.

District Lane Closure Review Committee:

- Reviews proposed work activities and approves or makes recommendations in a timely manner when planned activities are expected to 1) result in significant traffic impacts, or 2) be of an interregional, statewide, or otherwise sensitive nature.
- When the District Lane Closure Review Committee determines that consultation or approval by the Headquarters Lane Closure Review Committee is appropriate, requests through the District Traffic Manager that the Headquarters committee convene to discuss a specific project and its anticipated impacts.

District Transportation Management Plan Managers:

- Act as single focal points for planning and development of Transportation Management Plans. Participate in the evaluation of design, potential traffic impacts and mitigation measures for project alternatives and in the preparation of Project Study Reports, Project Reports, Plans, Specifications, and Estimates. The Transportation Management Plan Manager should involve District Traffic Manager, members of the Planning, Maintenance and Construction Divisions and the Project Development Team in the planning and development of the Transportation Management Plan to address all pertinent issues, including multi-modal strategies, roadway maintenance during temporary closures, and constructability review.
- Work with the District Traffic Manager, District Design, Project Manager, Construction and PIO as appropriate to determine the extent of a Transportation Management Plan and ensure that the Transportation Management Plans are updated during all phases of a project. Facilitate review, approval, modification or disapproval of all Transportation Management Plan measures.
- Consider the cumulative impact of multiple projects as well as other activities that may create or generate an increase in traffic demand within the limits and during the work period. Oversee implementation and coordination of inter-regional Transportation Management Plans between corridors, districts, neighboring states and Mexico.
- Ensure that Transportation Management Plan planning and implementation is coordinated with the CHP and other local and regional transportation stakeholders as appropriate.

APPENDIX – A

Deputy Directive – 60-R1

District Project Managers:

- Require Transportation Management Plans to be considered in the earliest stages of development for all projects and activities performed on the State Highway System.
- Identify needed project resources for all Transportation Management Plan measures and activities.
- Schedule projects to combine with other work activities to the extent possible.
- Encourage the use of innovative construction staging and contracting methods to accelerate project completion when appropriate.
- Include the District Transportation Management Plan Manager, the District Traffic Manager, and the PIO as needed on Project Development Teams from project initiation through completion of construction and provide adequate project information for review.
- Coordinate development of Transportation Management Plans with affected local and regional transportation stakeholders as needed.

District Traffic Managers:

- Consult with the Transportation Management Plan Manager during the planning and development of the Transportation Management Plan.
- Responsible with the District Construction Engineers, Resident Engineers, Encroachment Permit Inspectors, Maintenance Supervisors/Superintendents and PIO to ensure implementation of the Transportation Management Plan and make changes to the Transportation Management Plan if needed during conduct of the work.
- Determine when review of work activities by the District Lane Closure Review Committee or Headquarters Lane Closure Review Committee is required or necessary.
- Responsible for the day-to-day traffic decisions pertaining to traffic impacts from planned activities on the State Highway System.
- Coordinate with the Transportation Management Center or District Communication Center staff to respond with appropriate measures when significant travel delays occur on the State Highway System.
- Facilitate review, approval, modification, or disapproval of planned lane closure requests on the State Highway System.
- Recommend termination or modification of active planned lane closure operations without compromising the safety of the public or workers, when traffic impact becomes significant.
- Review construction contingency plans.

District Design, Office Engineer, Maintenance, and Encroachment Permit Engineers:

- Ensure Transportation Management Plan measures are fully incorporated in the development of a project.

APPENDIX – A

Deputy Directive – 60-R1

- Coordinate with the District Traffic Manager and the District Transportation Management Plan Manager to consider alternative strategies as appropriate to determine the best alternatives for balancing traffic impact cost, and construction duration and cost.
- Ensure that impacts of Transportation Management Plan options are fully considered during the development of work schedules and cost estimates.
- Coordinate with District Traffic Management and District Transportation Management Plan Manager if changes in Transportation Management Plan strategies are warranted during all phases of the work. Ensure that Transportation Management Plan content is up-to-date by obtaining certification of the Transportation Management Plan by District Traffic Manager and District Transportation Management Plan Manager before submittal to the Office Engineer at Ready-to-List phase.
- Develop project information in consultation with the Project Manager, District Traffic Manager and Transportation Management Plan Manager to present to the District Lane Closure Review Committee or Headquarters Lane Closure Review Committee when deemed appropriate.

District Construction Engineers, Resident Engineers, Encroachment Permit Inspectors, and Maintenance Supervisors/Superintendents:

- Ensure full implementation of approved Transportation Management Plans in close coordination with the District Traffic Manager so that disruption to the traveling public is minimized.
- Work with the District Traffic Manager to ensure that project activities conform to the Transportation Management Plan, contingency plans are implemented if necessary, and disruption to the traveling public is minimized and does not exceed limits established in the Transportation Management Plan.
- Include the District Transportation Management Plan Manager, the District Traffic Manager, and the PIO as appropriate in preconstruction or work planning meetings.
- Determine when a construction contingency plan from the contractor is required.
- Ensure contractor is prepared to comply with Transportation Management Plans as related to work performance.
- Notify District Communication Centers or Transportation Management Centers when unforeseen traffic impacts result from planned work.
- Notify the District Communication Center or Traffic Management Centers to report the status of all lane closures in a timely manner (when closures are put in place and when they are picked up) so that accurate information is provided to the public. When reporting, provide specific details, particularly when a planned lane closure may be picked up late and significant traffic impacts are expected to result.

APPENDIX – A

Deputy Directive – 60-R1

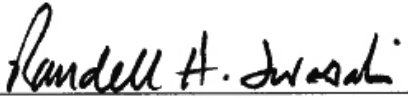
- Coordinate work activities with the CHP and other local and regional transportation stakeholders as appropriate.

Traffic Management Center Staff:

- Status lane closures in the statewide Lane Closure System.
- Activate Transportation System Management elements in support of the Transportation Management Plan.
- Inform the District Traffic Manager when notified of potential significant impacts due to planned highway activities.

APPLICABILITY

All departmental employees involved in Transportation Management Plan activities.






RANDELL H. IWASAKI
Chief Deputy Director

September 28, 2007
Date Signed

APPENDIX – B

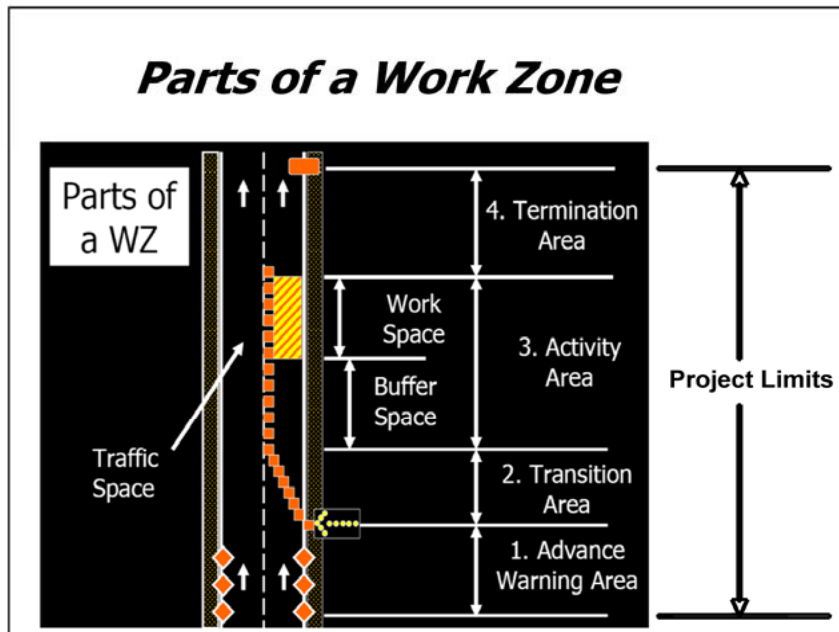
Work Zone Enforcement Pocket Guide

<p>California Department of Transportation in partnership with the California Highway Patrol</p> <p style="text-align: center;">WORK ZONE ENFORCEMENT (COZEEP/MAZEEP*)</p> <p style="text-align: center;">Pocket Guide</p> <div style="text-align: center;">  </div> <hr style="width: 20%; margin: 20px auto;"/> <p style="text-align: center;">(Project Name) (Route) (Post Miles) (Type of Project)</p>	<p>Primary Contact Numbers:</p> <ul style="list-style-type: none"> ■ Resident Engineer/Maintenance Supervisor: (Name and Phone Number) ■ Field Inspector: (Name and Phone Number) ■ CHP Cell Phone: ■ Contractor Phone: ■ TMC Phone: <p style="text-align: center;">First – Drive through the Work Zone to check setup *****</p> <p>Help Identify:</p> <ul style="list-style-type: none"> ■ Potentially Hazardous Conditions of any kind ■ Signs / Cones out of position ■ Inconsistent or Inadequate Advance Warning Signs <p>If Unexpected Problems arise:</p> <ul style="list-style-type: none"> ■ Notify the Caltrans Resident Engineer/Maintenance Supervisor or Inspector ■ Call the TMC if necessary <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>STAY ALERT!</p> <p>WATCH OUT FOR EACH OTHER!</p> </div> <div style="text-align: center;">  </div> </div> <ul style="list-style-type: none"> • *COZEEP – Construction Zone Enhanced Enforcement Program • *MAZEEP – Maintenance Zone Enhanced 	<p>Daily Briefing - Resident Engineer / Maintenance Supervisor, CHP Officer, and Contractor Rep</p> <p>Enforcement Specifics:</p> <ul style="list-style-type: none"> ■ Start & end times ■ Type of work being done ■ Where work is being done ■ Suggested location of CHP vehicle(s) ■ Strategy(ies) to be used (roving unless stationary specifically requested) ■ Communication protocol – contact R.E./Maintenance Supervisor or Field Inspector for inquiries or to report potential problems ■ Questions or suggestions <p>Enforcement Services:</p> <ul style="list-style-type: none"> ■ Presence – speeding deterrent ■ Enforcement ■ Traffic control (detours/queue assistance)
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APPENDIX – B

Work Zone Enforcement Pocket Guide

Work Zone Diagram



Investigations...?

- In order to remain in the Work Zone vicinity, all enforcement action that may result in an in-custody arrest should be relinquished to a Beat Officer. (CHP MM 05-120)

Advance Warning Signs

3-step process:

- 1st sign: Gets motorist's attention
- 2nd sign: Tells what's ahead
- 3rd sign: Tells them what to do

Stationary Strategies (usually COZEEP):

- **Stay on the shoulder**
- **Not in buffer space**
- **Relocate as needed based on traffic conditions**
- **1/4 mile ahead of the end of the queue**

Moving Operations (usually MAZEEP):

(Examples: Paving, Striping..)

- **The Work Zone moves continuously.**
- **You Should Move with it!**

Observe the "15-minute Rule":

- Arrive 15 minutes before traffic control devices are being placed, moved or taken down.
- Stay 15 minutes after these changes have taken place, to ensure that the new traffic control change is working properly.
- Pass on info to the next shift if needed.

APPENDIX – C

MAINTENANCE BLANKET TMP

List of activities that occur typically occur off the traveled way:

<ul style="list-style-type: none"> • Litter removal • Freeway Patrol for debris and litter • Tree work (trimming/pruning) • Landscaping area work (irrigation and repair, weed control, trimming, pruning, thinning, replacing) • Delineator/post mile marker repairs/replacement • Culvert/drainage facility work (cleaning/inspection) • Sign repairs/replacement • Off travel way median barrier/guard rail/attenuator repairs 	<ul style="list-style-type: none"> • Right-of -Way fence repair work • Sump pump repairs/cleaning • Ditch and channel cleaning work • Rest Area/Vista Points/Map View Area/Weigh Station/Park and Ride Lot (Public Facilities) maintenance work • Graffiti abatement/cleanup on walls/signs/equipment cabinets • Nonlandscaped area tree/brush/vegetation work • Nontraveled way electrical work • Roadside mowing • Shoulder area grading for lateral support
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Work that can be terminated (shoulder/lane closure picked up) if unacceptable delay occurs:

<ul style="list-style-type: none"> • Pavement marking operations • Sign lighting repair • Traffic signal knockdown repairs • Sweeping litter/debris operations • Moving shoulder/lane closure operations • Asphalt Concrete (AC) and Portland • Cement Concrete (PCC) pavement crack sealing 	<ul style="list-style-type: none"> • Pothole repairs • Drain inlet cleaning • Pavement striping operations • Raised pavement marker replacement • Sign and highway lighting relamping operations • Roadside vegetation control (spraying/mowing) operations
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Work that must be completed prior to reopening to traffic (shoulder/lane closure pick-up):

<ul style="list-style-type: none"> • Moving shoulder/lane closure operations • PCCP slab replacement • Pavement chip seals • Culvert replacement operations • Guardrail/gore attenuator repairs 	<ul style="list-style-type: none"> • AC pavement blankets • Pavement mudjack operations • Most bridge repair on traveled way • Pavement grinding (AC Digouts) operations
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APPENDIX – D

TMP RESOURCES

STATEWIDE TMP RESOURCES

For further guidance or questions on TMP content and this process, contact the TMP Manager in your District. For questions regarding TMP policy, contact HQ Office of System Management Operations. Organizational charts and contact information are on the Department's intranet at http://onramp.dot.ca.gov/hq/traffops/otrafopr/system_development/tmp.htm. External entities may contact their local Office of System Management at <http://www.dot.ca.gov/localoffice.htm>.

SOURCES OF TMP INFORMATION

A publication by the Federal Highway Administration, "Developing and Implementing Transportation Management Plans for Work Zones," contains a comprehensive work zone strategies matrix which provides information on triggers for considering various strategies, potential benefits and challenges, and other considerations that might help to determine the strategies that would work best.

Two sources for guidance on selecting the most effective TMP elements, in terms of cost and informational content are Wilbur Smith Associates' "Traffic Management Plan Effectiveness Study (May 1993)" and Frank Wilson & Associates' "A Traffic Management Plan Study for State Route 91 During Construction of HOV Lanes." Both of these publications can be obtained from HQ Traffic Operations, Office of System Management Operations.

The Public Information Office in each District is also an experienced source for public awareness campaign strategies, and they can help the TMP Manager estimate the cost and effectiveness of the proposed TMP strategies in reducing traffic demand through the project area.

APPENDIX – E SAMPLE TMP DATASHEET

TRANSPORTATION MANAGEMENT PLAN DATASHEET (Preliminary TMP Elements and Costs)

Co/Rte/KP _____ EA _____ Alternative No. _____

Project Limit _____

Project Description _____

Expected Construction Schedule _____

1) Public Information

- | | |
|---|----------|
| <input type="checkbox"/> a. Brochures and Mailers | \$ _____ |
| <input type="checkbox"/> b. Press Release | |
| <input type="checkbox"/> c. Paid Advertising | \$ _____ |
| <input type="checkbox"/> d. Public Information Center/Kiosk | \$ _____ |
| <input type="checkbox"/> e. Public Meeting/Speakers Bureau | |
| <input type="checkbox"/> f. Telephone Hotline | |
| <input type="checkbox"/> g. Internet | |
| <input type="checkbox"/> h. Others _____ | \$ _____ |

2) Motorists Information Strategies

- | | |
|---|----------|
| <input type="checkbox"/> a. Changeable Message Signs (Fixed) | \$ _____ |
| <input type="checkbox"/> b. Changeable Message Signs (Portable) | \$ _____ |
| <input type="checkbox"/> c. Ground Mounted Signs | \$ _____ |
| <input type="checkbox"/> d. Highway Advisory Radio | \$ _____ |
| <input type="checkbox"/> e. Caltrans Highway Information Network (CHIN) | |
| <input type="checkbox"/> f. Others _____ | \$ _____ |

3) Incident Management

- | | |
|---|----------|
| <input type="checkbox"/> a. Construction Zone Enhanced Enforcement Program (COZEEP) | \$ _____ |
| <input type="checkbox"/> b. Freeway Service Patrol | \$ _____ |
| <input type="checkbox"/> c. Traffic Management Team | |
| <input type="checkbox"/> d. Helicopter Surveillance | \$ _____ |
| <input type="checkbox"/> e. Traffic Surveillance Stations (Loop Detector and CCTV) | \$ _____ |
| <input type="checkbox"/> f. Others _____ | \$ _____ |

APPENDIX – E

SAMPLE TMP DATASHEET

4) Construction Strategies

<input type="checkbox"/>	a. Lane Closure Chart	
<input type="checkbox"/>	b. Reversible Lanes	
<input type="checkbox"/>	c. Total Facility Closure	
<input type="checkbox"/>	d. Contra Flow	
<input type="checkbox"/>	e. Truck Traffic Restrictions	\$ _____
<input type="checkbox"/>	f. Reduced Speed Zone	\$ _____
<input type="checkbox"/>	g. Connector and Ramp Closures	
<input type="checkbox"/>	h. Incentive and Disincentive Clause	\$ _____
<input type="checkbox"/>	i. Moveable Barrier	\$ _____
<input type="checkbox"/>	j. Others _____	\$ _____

5) Demand Management

<input type="checkbox"/>	a. HOV Lanes/Ramps (New or Convert)	\$ _____
<input type="checkbox"/>	b. Park and Ride Lots	\$ _____
<input type="checkbox"/>	c. Rideshare Incentives	\$ _____
<input type="checkbox"/>	d. Variable Work Hours	
<input type="checkbox"/>	e. Telecommute	
<input type="checkbox"/>	f. Ramp Metering (Temporary Installation)	\$ _____
<input type="checkbox"/>	g. Ramp Metering (Modify Existing)	\$ _____
<input type="checkbox"/>	h. Others _____	\$ _____

6) Alternative Route Strategies

<input type="checkbox"/>	a. Add Capacity to Freeway Connector	\$ _____
<input type="checkbox"/>	b. Street Improvement (widening, traffic signal... etc)	\$ _____
<input type="checkbox"/>	c. Traffic Control Officers	\$ _____
<input type="checkbox"/>	d. Parking Restrictions	
<input type="checkbox"/>	e. Others _____	\$ _____

7) Other Strategies

<input type="checkbox"/>	a. Application of New Technology	\$ _____
<input type="checkbox"/>	e. Others _____	\$ _____

TOTAL ESTIMATED COST OF TMP ELEMENTS =	\$ _____
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APPENDIX – E

SAMPLE TMP DATASHEET

Project Notes:

Assumptions/ Comments:

1. Entire project will take approximately XX working days to construct.
2. Current dollar values used. Inflation was not factored into the estimate.
3. Traffic Control/Maintain Traffic costs were not provided. Please consult with the OE or Construction office for this estimate.
4. Portable CMS specified for this project by this estimate are designated for congestion relief as outlined by DD-60. Portable CMS required for other purposes should be included under other specifications.
5. The COZEEP specified for this project by this estimate is designated for congestion relief as outlined by DD-60. The COZEEP required for other purposes should be included under other specifications.

Note 1: All projects who's contract value is \$5 million or more, and/or meet certain other criteria should be evaluated for applicability of A+B Bidding. Consult the Lane Closure Charts Coordinator for the analysis, and the OE for more details about A+B Bidding.

Note 2: As outlined in Deputy Directive 60, this TMP is a living document, subject to change as required by changing circumstances. If there is material change to the project scope which will affect the function or adequacy of the TMP, then changes to the TMP must be addressed. If traffic conditions at the project site demonstrate that TMP elements need to be adjusted to adequately address congestion, then the TMP shall be altered accordingly.

Note 3: Hospitals with emergency services and fire stations that may require access through work zones at all hours should be accommodated. Schools, major venues, shopping malls, and other heavily utilized areas should also be notified of construction activities that may impact their services.

PREPARED BY

DATE

APPROVED BY

DATE
